In Aid We Trust:
Hearts and Minds and the Pakistan Earthquake of 2005[1]

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Abstract

Winning "hearts and minds" in the Muslim world is an explicitly acknowledged aim of U.S. foreign policy and increasingly, bilateral foreign aid is recognized as a vehicle towards this end. We examine the effect of aid from foreign organizations and on-the-ground presence of foreigners following the 2005 earthquake in Northern Pakistan on local attitudes. We show that four years after the earthquake, humanitarian assistance by foreigners and foreign organizations has left a lasting imprint on population attitudes. Measured in three different ways those living closer to the fault-line report more positive attitudes towards foreigners, including Europeans and Americans; trust in foreigners decreases 6 percentage points for every 10 Kilometers distance from the fault-line. In contrast, there is no association between distance to the fault-line and trust in local populations. Pre-existing differences in socioeconomic characteristics or population attitudes do not account for this finding. Instead, the relationship between trust in foreigners and proximity to the fault-line mirrors the greater provision of foreign aid and foreign presence in these villages. In villages closest to the fault-line, foreign organizations were the second largest providers of aid after the Pakistan army (despite reports to the contrary aid provision by militant organizations was extremely limited, with less than 1 percent of all respondents reporting any help from such organizations). The results provide a compelling case that trust in foreigners is malleable, responds to humanitarian actions by foreigners and is not a deep-rooted function of local preferences.

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"…but the ultimate victory will depend upon the hearts and the minds of the people who actually live out there. By helping to bring them hope and electricity you are also striking a very important blow for the cause of freedom throughout the world."

Lyndon B. Johnson, President of the United States, 1963-1969. Remarks at a Dinner Meeting of the Texas Electric Cooperatives, Inc., May 4, 1965

Introduction

Winning hearts and minds has moved to the forefront of foreign policy in many countries and is a part of the general lexicon of dealing with the Muslim world in the decade after 9/11. With nation building and planning for the post conflict phase in full motion in Iraq and Afghanistan, winning "hearts and minds" in the region is now more than ever seen as a legitimate and perhaps even a principal aim of providing bilateral foreign assistance in conflict ridden areas. The relationship between population attitudes and foreign aid is particularly salient in Pakistan, a country that has seen a sharp increase in terrorist incidents between 2006 and 2008.[2] Especially worrisome is the "trust deficit" between Pakistan and countries like the U.S., an issue that has been publicly acknowledged as hindering the effectiveness of aid in furthering development outcomes.[3] Devastating floods in the summer of 2010 in Pakistan have only served to highlight the importance of this point: There has been considerable debate among policy analysts on the value of aid as a means of counteracting the activities of the militant organizations who might step in to provide timely and much needed assistance.[4] Given the intense public scrutiny and important policy implications, it is therefore surprising that there is little direct evidence on the relationship between foreign aid and population attitudes in the

[2] A U.S. state department report documents 1,839 terrorist incidents in Pakistan in 2008 compared to 890 in 2007 (U.S. State Department, 2009).

[3] See for instance in discussions leading to the passage of the Kerry-Lugar Bill signed this year to provide aid to Pakistan. A June 2010 poll in Pakistan by Pew shows that 68 percent of the population has an "unfavorable" view of the United States.

[4] See for instance Howard LaFranchi in the *Christian Science Monitor* (http://www.csmonitor.com/USA/Foreign-Policy/2010/0803/Pakistan-flood-relief-Could-it-undercut-Taliban-influence), Huma Yusuf in *Dawn* (http://www.dawn.com/wps/wcm/connect/dawn-content-library/dawn/the-newspaper/columnists/19-huma-yusuf-the-link-with-governance-180-hh-06) or the editors of CNN.com (http://afghanistan.blogs.cnn.com/2010/08/03/u-s-sees-opportunity-in-pakistani-floods/)

extant literature.[5] Using the events following the 2005 earthquake in Pakistan together with a specially designed household census and survey of more than 28,000 households implemented by the authors in 2009 in four earthquake-affected districts, we are able to provide the first such evidence. We find that mirroring the provision of foreign assistance, trust in foreigners increases dramatically in households living closer to the 2005 earthquake activated fault-line.

The 2005 Pakistan earthquake provides a particularly suitable environment to quantitatively estimate the effects of *particular types* of foreign assistance on the "hearts and minds" of the local population. The powerful 7.6 magnitude earthquake that struck the North-Eastern region of Pakistan on October 8th, 2005 along the Himalayan Frontal Thrust Fault resulted in unprecedented destruction of property and loss of life. An estimated 74,000 Pakistanis died, 70,000 were seriously injured, and over 2.8 million were left homeless. Between October and January, there was a desperate "race against winter"—an all-out effort to get households into some sort of shelter before the harsh Himalayan winter resulted in even higher casualties. Given the severely correlated shock that ruled out any sort of local risk-sharing, it is likely that assistance received during this time had a very high marginal utility and would thus have an especially strong impact on individual attitudes towards the aid provider.

Immediately following the earthquake, there was a remarkable outpouring of aid from all over Pakistan and around the world. This aid came in many shapes and forms. Apart from financial support for the Pakistani government, organizations and individuals provided logistical and technical assistance. A multitude of people ranging from doctors, nurses to trained personnel specializing in excavation arrived from around the world into the affected region. Till March 2006, foreign organizations continued to provide support in terms of emergency shelters and

[5] In contrast, there is a large and heavily debated literature on the effectiveness of aid in terms of influencing poverty, governance or other economic outcomes. See for instance, Banerjee 2007 and Bourguignon and Sundberg 2007.

food. Both authors were involved in designing coordinating mechanisms for earthquake relief and spent time in the earthquake zone immediately after the earthquake. One of the authors (Das) spent a month in the affected regions in December 2005, during the "race against winter". During this period organizations worked around the clock to clear roads, provide tin roofs using helicopters and trucks and distribute food and medicines to affected populations.

What is perhaps crucial is that in a short period of time, a large fraction of the affected population received *direct aid* from foreigners or foreign organizations at a time when it was hard to argue that the assistance was "strategic" or politically motivated. As Wilder (2008) reports based on focus groups in the earthquake-affected regions: "*There was a near unanimous sentiment by local respondents that these organizations responded for humanitarian reasons rather than to promote hidden political, cultural or religious agendas. There was also a strong perception that international aid workers were generally culturally sensitive."* Overwhelmingly, people believed that this was humanitarian assistance at its most human. It is therefore plausible that an aid effort of this intensity, magnitude and diversity at a time when it was desperately needed would remain salient in the recipient's experience and perhaps have a persistent effect on their attitudes, views and beliefs four years after the fact.

Equally important, the 2005 earthquake can be regarded as a "quasi-experiment" that helps us interpret the effect of earthquake on population attitudes towards foreigners in a causal manner, and helps construct a further compelling case that this "earthquake effect" is in large part, due to the direct presence of foreign organizations and foreigners in the affected regions. To clarify, a causal estimate of aid asks the counterfactual question of how the aid recipient *would have fared* had she not received the aid. In practice, this effect is estimated by comparing the outcome among aid recipients to an appropriate "control" group that ideally differs from the

"treatment" group only in the fact that it did not receive aid—as would be the case if aid were distributed to randomly selected individuals in the population. The causal effect of aid is hard to determine due to selection biases that arise precisely from the non-random fashion in which aid is distributed—the population that receives aid is, in general, not identical to the population that does not.[6] To the extent that these differences are correlated with population attitudes, a simple comparison of attitudes among those who did and did not receive aid will likely be biased: For instance, if aid was given to those who are very poor, to what extent was trust higher among recipients *because* of the aid versus because they were poor, or (even more difficult) because the unobserved attributes that contributed to their poverty also affected their trust in others?

In the context of the earthquake, interpreting differences in current-population attributes as a *consequence* of the earthquake-shock will be problematic if, for instance, people knew where the fault-line was and made their location decisions accordingly. Our main contribution relating aid to trust address this issue and is motivated by the fact that within the 2005 earthquake zone, the distribution of population and its socioeconomic characteristics was randomly distributed vis-à-vis the activated fault-line. To begin with, we adopt a tight specification by including district fixed-effects in our estimates, thus exploiting only *within-district* variation. We then provide a number of tests to verify that those affected by an earthquake shock of greater intensity (living closer to the fault-line) were no different from those who received a shock of lower intensity (living farther from the fault-line) *prior to the earthquake*. Thus differences in foreign aid received and attitudes towards foreigners between people further away and closer to the fault-line can be attributed *entirely* to the earthquake shock

[6] Aid might be given to a country or within a country to a group of people who differ on many, potentially unobservable dimensions from people who did not get aid. For instance, aid is often motivated by considerations of *realpolitik*. In times of conflict, it could be given to people who are allies but also could be given to influence those who might not agree with the donor. Alternatively, recipients could be chosen because they are more efficient and thus able to utilize aid better or perhaps because they are in worse conditions than others.

and not to any differences (potentially unobserved) in the population. These post-earthquake outcomes reflect both the earthquake shock and its resulting changes—both negative in terms of dislocation or the loss of housing, and positive in terms of the tremendous amounts of aid received. Nevertheless, the earthquake shock remains the causal factor since all other factors including foreign aid--the channels through which this effect operates—are still caused by the earthquake.[7]

As a first step in our empirical strategy, we show that the earthquake shock causally increased trust in foreigners and causally increased the presence of foreign organizations in local populations. To further demonstrate that the two are linked, we show that the earthquake shock did *not* increase trust in local populations and that differences in risk-aversion (a factor that has been identified in the literature as affecting trust), per-capita consumption (a measure of permanent income), or the extent of local aid received do not account for our findings. Further, the relationship between the earthquake shock and trust disappears once we control for foreigner presence in the village. Finally, an instrumental variable strategy using distance to the fault-line as an instrument for foreign aid/presence shows strong effects of aid on differential trust between foreigners and locals. It is possible to construct particular alternative hypotheses that could be consistent with our findings, but the evidence put together creates a compelling case for the impact of "boots-on-the-ground" foreign presence on local population attitudes.

The policy implications are significant. Aid delivered on the ground by foreign organizations and foreigners, has a large positive effect on people's attitudes towards foreigners. These effects remain salient four years after the fact in an environment characterized by low trust

[7] This is generally not true of all disasters: For instance both in the Asian Tsunami and the recent Pakistan floods, those affected by the disaster were very different from those who were relatively unaffected. Populations living closer to the sea are different from those living further and people who live in a flood plain are in all likelihood different from those who live further away, particularly since flooding is a recurrent phenomenon that is anticipated.

in foreigners and Americans, despite the fact that in the intervening years the media has been full of negative reports of American drone attacks in parts of Pakistan and controversy has brewed about insensitive cartoons published in Europe. At the very least, the results suggest that attitudes towards foreigners are *malleable* and respond to the specific actions of foreigners. The results do not support the notion that low trust arises from deep-rooted population preferences and beliefs. At the same time, it is worth emphasizing that we examine only one type of aid in a particular, albeit very important case and our contribution can be seen as a pure *existence* result: a *certain* type of aid and assistance does change population attitudes towards foreigners. This does not necessarily imply that other types of aid, in different circumstances or place would have the same, different or no effect at all.

The remainder of the paper is organized as follows. The next section briefly describes the literature and the data. We next discuss our identification strategy and then the results.

Literature Review

Trust and social capital are increasingly recognized as an integral part of how societies function and the existing literature has focused on three distinct strands. One strand looks at correlations between trust and country outcomes. Starting from Putnam's (1993) classic work on the link between trust and disparities of income between Italian regions, a literature—most notably Knack and Keefer (1997) and Knack and Zak (1999)—have demonstrated a robust correlation between levels of trust in countries and their economic outcomes. Recent work also documents the link between trust and microeconomic outcomes (Karlan, 2005). A second strand of the literature (Alesina and La Ferrara 2002) takes a step back to examine the determinants of trust. At the individual level, their results confirm lower levels of trust among women and the less educated, but perhaps their most striking result is that "individuals who dislike inter-racial

contacts also trust others less, the more heterogeneous their community is" suggesting strategic complementarities in trust that can lead to multiple equilibria whereby high levels of trust encourage further trust building and vice-versa. A third strand of the literature goes back to basics to ask what trust questions like those used in the World Values Surveys really measure. For instance, Glaeser and others (2000) show that individuals do not show the same trust characteristics in experimental games as they do in their responses to trust questions—although more trusting responses to survey questions are given by those who are themselves more trustworthy in experimental games. People may confuse trusting others and being worthy of the trust of others. These results appear to hold in the middle-income settings of Thailand and Vietnam as well (Carprenter and others 2004). Glaeser and others' (2000) initial contribution ignited a lively debate (see for instance, Fehr and others 2003); recent work by Sapeinza and others (2008) shows that the lack of a relationship between experimental and survey-based approaches arises because experimental games confound the respondent's characteristics (such as risk aversion) with their belief/trust in others. They argue that questions such as those in the WVS legitimately measure variation in trust in populations. Related to the notion that respondent characteristics are correlated with their responses on questions of trust, Eckel and Wilson (2004) experimentally test the idea that trust is related to risk aversion (Ben-Ner and Putterman 2001 and Karlan 2005)—individuals with more risky attitudes also trust more. Their results suggest little relationship between risk attitudes and trust; in a complementary study, Bohnet and Zeckhauser (2004) suggest that the psychological costs of perceived betrayal may be closely related to trust.

To our knowledge, there is currently no information on the effect of foreign aid on trust or on the impact of disasters on trust. Closest to our study is the fascinating work by Berman,

Shapiro and Felter (2009) showing that improved service delivery in Iraq reduced insurgent violence, but in the absence of data on population attitudes the authors do not look at trust outcomes as a consequence of increased aid. In the context of Pakistan, Andrew Wilder reports results from focus groups with NGOs, aid workers and aid recipients on the after effects of the Pakistani earthquake; Wilder believes that the immediate aid following the earthquake may have had an impact but that these attitudinal effects were unlikely to persist over time. Also on Pakistan, several recent surveys measure attitudes towards Americans. As discussed by Fair and others (2009) the quality and coverage of these surveys is hard to gauge—in some cases, respondent-level data are not available (for instance, Gallup), in others non-response rates are high. In general, the coverage of these surveys (primarily urban areas) and social-desirability bias in the questions cloud interpretation of the data. The one exception is a recent large survey that combines a representative sample with an endorsement game to examine attitudes towards militancy and its correlates with education and income; for our purposes, an important finding is the lack of a relationship between support for militant groups and anti-Americanism (Fair and others, 2009).

Finally, a growing literature examines the impact of disasters on economic outcomes. Portner (2009) discusses the effects of natural disasters on child health. Baez and Santos (2007) examine the effect of hurricane Mitch in Nicaragua on child outcomes using a difference in difference strategy based on the LSMS panel data with municipalities that are affected by the hurricane versus those that were not. It is worth emphasizing that causality is harder to establish in this case because the path of hurricanes is known and anticipated 2-3 days before the event—the people who stay behind could well be different from those who leave the area. Similarly, in

the case of flooding or in the Tsunami, populations living close to the river bank/sea were likely very different from those further away.[8]

Data

Our data are based on a survey conducted in 2009 of 126 randomly selected villages in four earthquake-affected districts. Two of the districts—Bagh and Muzaffarabad are in the Azad Jammu Kashmir area of Pakistan and two—Abbottabad and Mansehra are in the North Western Frontier Province, or NWFP. The data-collection was done in two parts. The first part, conducted in spring 2009, was a complete census listing of more than 28,000 households living in these villages including their GPS coordinates. As part of this data-collection exercise, we also collected information on socioeconomic characteristics of all individuals within the household and mortality from the earthquake. In addition, the census also asked households about organizations that came to help them in the 3 months after the earthquake. Following the detailed census, we randomly sampled 10 percent of the households for detailed follow-up on the impact of the earthquake and the post-quake recovery. In addition to standard modules on living conditions and socioeconomic status, we also implemented a complete module on attitudes towards foreigners. This module included questions on trust, the willingness and ability of different communities to work together and the kindness of strangers (the questions are detailed further below). We emphasize that the data-collection was conducted by surveyors local to each district surveyed, led by supervisors who have been trained by the authors over a 4-year period in the context of other survey-based work in Pakistan on education (www.leapsproject.org).

[8] A similar argument could be made in the context of earthquakes a well—people can *choose* to live far from a fault-line. The key observation for our results is that the households we compare are never those living far from *any* fault-line to those living close to the activated fault-line. By including district fixed-effects, we compare households who vary in distance from the fault-line by 20-40Km and given the preponderance of fault-lines in the region (54 in all), each one of these households lives close to *some* fault-line that may be activated in the future.

A key component of our empirical strategy relies on the distance of the household from the active fault-line and the epicenter of the earthquake. We obtained the digital mapping of the Himalayan Frontal Thrust—the activate fault-line shown in Figure 1-- from publicly available geological maps. We then calculated the linear distance to the fault-line and the distance to the epicenter using each household's GPS location and using the Haversine formula.[9] These spatial data were supplemented with data on the average and maximum slope of the Union Council (a group of 4-5 geographically contiguous villages) to account for the hilliness of the terrain. Finally, we also complement these data with statistical village level data provided in the 1998 village population census to examine correlations between population characteristics and the intensity of the earthquake. We use these data, together with retrospective information from the household survey in 2009 to investigate pre-existing correlations between socioeconomic characteristics and earthquake intensity.

Table 1 provides descriptive statistics for the variables used in the study. There are 4670 individuals in our sample, of whom 49.8 percent (2324) are male and 46.5 percent have obtained some formal education. The average household was 18.8 Km from the fault-line and 38.6 Km from the epicenter; as expected, the bulk of the sample lies in the mountainous regions of the two provinces surveyed.

Particularly relevant are answers to the questions on trust. We asked the following question from one male and one female respondent within each household, typically the head of household and his/her spouse and coded the responses in a binary fashion as "yes" or "no":

> *Imagine you are walking down a street and dropped a Rs. 1000 note without noticing. _____ was walking behind you without you knowing and picked it up. What is the likelihood that they would return it to you?*

[9] Wikipedia has the clearest descrption: http://en.wikipedia.org/wiki/Haversine_formula

This departs from the usual question asked in the World Values Survey (WVS) on trust: "*Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people*?" In altering the question, our primary aim was to remove *agency* on the part of the respondent. As evinced from experimental validations, the WVS question requires an *active* decision that could be subject to biases such as the assessed risk of betrayal. In contrast, our question does not involve any agency—the money is accidentally dropped, and we ask about the likelihood that it will be returned. Previous work by Sapienza and others (2008) validated our survey question in an experimental setting and documented both a high correlation with the WVS question as well as the elicited belief in the trustworthiness of the others. This question may bring with it other potential biases, which we discuss in the robustness section below.

We ask for the respondent's attitudes towards the following groups: 1) People in general; 2) Extended family; 3) People in your village; 4) People in your *qaum*/caste/clan/*biradari* (quam in Urdu translates roughly as "clan" and biradri as the kinship group); 5) People in your region; 6) Other Pakistani; 7) General foreigner; 8) European/American; and 9) Islamic foreigner. The first startling summary statistic is that trust in people from the respondent's own village, prople from the same biradri/quam and people from the same region is very low, ranging from 16.9 percent positive responses (i.e., the fraction who thought that the money would be returned) for people from the same region to 29.7 percent for people from the same biradri/quam. These numbers are nevertheless in line with results from the general trust question in the WVS, where 31 percent of individuals respond positively when asked whether most people can be trusted. Many more people believe (46.7 percent) believe that foreigners can be trusted and the numbers

are even higher (48.7 percent) for trust in Europeans and Americans. This difference and its relationship to the distance from the fault-line are of key interest in our analysis below.

In addition, we also asked about the ability of people to work together through the survey question (we call this the "work-compatibility" question):

> *Do you feel that the ability of different religions, nationalities, and races to work together for a common cause is:*
> *1 = Very low*
> *2 = Low*
> *3 = Neither low nor high*
> *4 = High*
> *5 = Very high*

We aggregate the responses into a binary variable that differentiates between "high" or "very high" (4 or 5) and "very low", "low" and "neither" (1, 2, or 3). As such, we are again able to measure those respondents whose opinions of others are positive relative to those who are neutral or negative. On average, around 40 percent of respondents feel that the ability of people from different backgrounds to work together is "high" or "very high"; again, the relationship between the response to this question and the distance from the fault-line will nuance this overall summary statistic.

Finally, helpfulness and kindness comes from the following question asked of all respondents in the household survey:

> *After the earthquake, your opinion of the helpfulness and kindness of {name} is:*
> *1 = Much better than before*
> *2 = Better than before*
> *3 = Same*
> *4 = Less than before*
> *5 = Much less*

Again, we split the Likert scale into a binary variable; "better" (1 or 2) and "same or worse" (3, 4, or 5). Thus, when presenting our findings, we are measuring the fraction of respondents

whose perceptions of helpfulness and kindness have increased following the earthquake and subsequent relief efforts. The respondents are asked to give answers for each of the groups as in the trust question.

Empirical Strategy

Our ideal specification would regress population attitudes on whether foreigners came to help the household, potentially controlling for other covariates including geographic variables. There are a number of reasons why the coefficient of this regression could be biased. First, aid may be given to households and villages who trust foreigners more or are more "open" to outsiders. As a concrete example, foreign organizations were discouraged from operating in Kohistan, a part of the Provincially Administered Tribal Areas (or PATA) precisely because the population was not amenable to assistance from non-Islamic groups. We refer to such problems as those arising from correlations between aid and observed (or unobserved) population characteristics that are *time-invariant*. Second, the intensity of the earthquake itself could have generated a change in trust perhaps because when a large loss has been incurred, individuals trust strangers to help them out. We therefore proceed in two steps.

In the first step, we show that distance to the fault-line was a strong predictor of the intensity of the earthquake and of foreign presence. We estimate:

$$A_{ij} = \alpha + \delta D_{ij} + \mu X_{ij} + \eta_{ij} \qquad \text{(Equation 1)}$$

Where A_{ij} is the fraction of respondents in the village who report that they received assistance from a foreigner or foreign organization, D_{ij} is the average distance from the fault-line and X_{ij} are household characteristics. We also estimate the same equation at the village-level.

In the second step we show that the earthquake led to an increase in local populations trust towards foreigners and towards Americans and Europeans. We argue that this is a *causal result*. Specifically, we estimate:

$$T_{ij} = \alpha + \beta D_{ij} + \gamma X_{ij} + \varepsilon_{ij} \qquad \text{(Equation 1)}$$

where T_{ij} is the response to the trust question towards foreigners for individual i in village j and D_{ij} is the distance of individual i in village j from the fault-line and X_{ij} is a vector of respondent characteristics (age, sex and education) and village-specific characteristics that include the distance from the epicenter, the average slope of the Union-Council and district dummies as additional controls. Any correlation between ε_{ij} and D_{ij} will bias the coefficient, with the sign of the bias depending on the sign of the correlation. Below we present test results to argue that this correlation is zero in our context.

Note that the coefficient on the distance from the fault-line captures both the effect of aid *and* the generalized effect of the earthquake shock on trust. For instance, if a near-death experience increases trust in others, β will be positive even without an aid effect. To argue that β does not capture a general earthquake effect, we re-estimate Equation (2) using trust in locals as the dependent variable. To the extent that the estimated coefficient on distance to the fault-line is lower, it would argue for an aid rather than an earthquake effect in Equation (2).

In essence, we build towards an instrumental variables regression, where the impact of distance on aid represents the first stage and Equation (2) in its difference form (the difference in trust in foreigners and trust in locals) represents the reduced-form. Unobserved time-invariant errors that could lead to violations of the exclusion restriction are ruled out due to the exogeneity of the earthquake shock; this leaves time-variant quake effects as potential confounders. We

discuss these in the robustness section. To implement this instrumental variables specification, our village-level regression is

$$\Delta T_i = \alpha + \lambda ForeignAid_i + \rho X_i + \theta_i \qquad \text{(Equation 3)}$$

where $ForeignAid_i$ is the fraction of the village reporting foreign aid and X_i are the vector of control variables as mentioned above. $ForeignAid_i$ is instrumented using average village distance from the fault-line.

Was earthquake intensity uncorrelated with Pre-Quake household characteristics?

As discussed previously, our estimates may be biased if households who located closer to the activated fault-line were different from those who lived farther away. Critical to our causal interpretation of the association between earthquake intensity and distance from the fault-line is the lack of a correlation between pre-earthquake characteristics and this distance. There are several findings that support this claim.

First, the earthquake in the region was the first to strike after a long period of relative calm in the region. Between 1935 and 2005 there were no earthquakes above size 7 in Pakistan and all earthquakes above this magnitude struck the province of Balochistan between 1883 and 1995. There was a smaller earthquake (6.2 on the Richter scale) called the Hunza earthquake that struck Hunza, Hazara and Swat districts in North-West Frontier Province in 1974, but these districts were mostly unaffected in the current catastrophe. In this region, there are close to 50 potentially active fault-lines and there is no reason to geologically believe that one fault-line is more likely to be activated relative to another (uniquely, earthquakes are the only disasters where there is zero lead time in the forecasting). Since we use district fixed-effects in our estimation, thus relying on the distance to the activated fault-line for a population that is geographically

contiguous, most of the households in our survey live close to *some* fault-line that is was equally likely to be activated. Thus, it is reasonable to assume that populations were randomly distributed in terms of their attitudes towards foreigners with respect to the Himalayan Frontal Thrust where the earthquake occurred.

To provide explicit justification for this claim we regress a large number of village and household-level characteristics drawn both from the population census in 1998 and retrospective questions in our household survey on the distance to the fault-line. To the extent that these correlations are small and insignificant, we can confirm that the fault-line was orthogonal to pre-existing population conditions. Note that in this particular case, the lack of correlations on observed attributes provides a particularly strong justification for lack of correlations on unobserved attributes as well, since housing choices are unlikely to have been made on the basis of population attitudes towards foreigners that are not related to observed characteristics such as education.

The village characteristics are regressed on the mean distance of the households in the village from the fault-line and district fixed effects. In addition, since the epicenter of the earthquake was quite close to the city of Muzaffarabad, we also control for distance to the epicenter. The census provides us with population variables (total and female) as well as education (village adult literacy rate and fraction of women with a secondary education) and some housing infrastructure variables—fraction of houses with electricity, with indoor water and a variable reflecting the type of construction. Using principal components methods, we create a village infrastructure index that combines the three infrastructure variables.

Table 2 confirms the basic results that the distance to the fault-line is not correlated with pre-quake village-level education and infrastructure. The distance to the fault-line effect is small

in magnitude and statistically insignificant. In Appendix Table 1, we then examine further correlations using data from our household survey and on retrospective and current location data on village facilities. We find no correlation between distance to the fault-line and adult education, water supply or residence in a permanent structure before the earthquake. Neither do we find any correlation between distance to the fault-line and the distance between the household and the closest private school, public school, water pump, medical facility or market. We do find that households who lived farther from the fault-line were less likely to report that they had electricity before the earthquake; given that we assess 11 different variables, we would expect at least 1 to show up as significant by pure chance. Taken together, both village and household data appear to confirm that pre-existing characteristics were *not* correlated with distance to the fault-line.

Results: Destruction, Aid and Trust

Four figures highlight the main results, following the discussion above. We present these and then turn to the regression results.

Destruction:

Figures 2a and 2b plot the non-parametric relationship between village-level destruction and distance to the fault-line, showing the utter devastation as a result of the 2005 earthquake. Public reports on the earthquake document more than 75,000 deaths; our data bear out the heavy burden. Figure 2a uses information from the household census and shows that most of the deaths occurred in the immediate vicinity of the fault-line where the earthquake shock was the most intense. More than 15 percent of the households in villages those are within 5 kilometers of the fault-line report a death within the household due to the earthquake. The deaths gradually taper out as we move further away from the fault-line.

Most of these deaths were due to the collapse of housing structures. Our census data also capture information on homes that were partially damaged and those completely destroyed. The figure shows that more than 80 percent of the households report complete destruction of their homes within the immediate vicinity of the earthquake. Since quality of the pre-earthquake housing as reported in the 1998 population census and in our own survey is uncorrelated with the fault-line, this is a causal effect of the earthquake shock and not due to the differential housing quality closer to the fault-line. The housing collapse tapers off slowly with distance from the fault-line and even households living twenty kilometers away show a 40 percent rate of destruction. Combining partially and fully destroyed properties, almost every single house within 5 kilometers of the fault-line was affected. Predictably, the percentage of houses that are partially damaged increases farther from the fault-line; consequently, the percentage of houses that were either fully destroyed or damaged decreases very slowly with distance from the fault-line. Confirming the destruction at the household level, Figure 2b shows the collapse of facilities, both public and private due to the earthquake. More than 65 percent of all facilities were completely destroyed in villages closest to the fault -line.

Aid

The sudden and immediate destruction following from the earthquake resulted in an outpouring of aid and assistance, both from within Pakistan and from the global community. As part of our census, every household (28,000 in all) was asked to name as many organizations/groups of people that they directly witnessed providing aid in their village within the first six months of the earthquake. The time period was specifically restricted to focus (a) on the rapid assistance provided as part of the "race-against-winter" and (b) the rescue, relief and rehabilitation phase of the recovery rather than reconstruction. For instance, between October

2005 and March 2006, U.S. aircraft flew more than 5,000 sorties, delivering over 9 million kilograms (20 million pounds) of aid. Medical units treated 30,000 patients and crews cleared more than 35,300 metric tons (40,000 short tons) of debris. By end of March 2006, the U.S. had wrapped up its relief operations, as had all other foreign organizations.[10] From this point on, the transition to reconstruction had begun, and aid was channeled almost entirely through the Pakistan Government's Earthquake Rehabilitation and Reconstruction Authority (ERRA).

The answers to our organization question ranged from very precise names such as "MSF-Doctors without Borders", "Islamic Relief", "UNHCR", "Christian Aid" Pakistan Army, to "A Group of Teachers" "A Group of Foreigners", "A Japanese NGO" and "No One Came". In all, we documented 203 distinct names of organizations or groups that were reported in the census. The mean number of organizations reported per village was more than 13 and some villages reported more than 45 different groups who came to offer aid.

There are two reasons why we use household self-reports rather than administrative data to construct our measure of foreign presence and assistance. First, the earthquake zone lay predominantly in a hilly and mountainous area. Village populations are scattered over hilly, rugged terrain and an organizations' claim of reaching a village with aid may be relevant only to a small portion of the village. Thus it is entirely likely that some households within the same village could report aid while others would not. In our data, in line with the geography of the area, there is considerable within-village variation in terms of reports of aid received. Second, administrative data that currently exist for most aid providers is typically reported at the district level. Most aid providers do not have any standardized methods of reporting at the village level, or, as is relevant for our analysis, of differentiating small settlements within villages from the

[10] The information was obtained from various U.S. Embassy Press Releases from the Embassy of the United States in Islamabad.

village administrative boundaries as defined in the Pakistan population census. We use district fixed-effects in our estimation strategy and thus rely entirely on within district variation in population attitudes. Even if we could run an across-district comparison, our sample size would be restricted to six, which was the total number of districts affected.

Using these data, Figure 3a provides evidence of the tremendous diversity of organizations that came to help in the first three months after the earthquake, both by Pakistani and foreign organizations. The Pakistan Army was the dominant relief provider and served as the lead relief agency; 73 percent of all households report that somebody from the Army came to help. Other Pakistani organizations included different government departments and all types of Pakistani NGOs. We separate the foreign organizations into foreign Islamic and other foreign (labeled foreign) as they both played important roles in relief. Combining foreign and foreign Islamic organizations with the UN shows that more than 40 percent of households in our sample reported that at least one foreign organization or came to their help. Such an inflow of foreigners united to work together for a humanitarian cause in such short an interval had never been observed in this part of the world ever before.

Relating the reporting of aid to distance to the fault-line (Figure 3b) reveals a number of important relationships. First, as one might expect, there was a large presence of organizations in the hardest hit areas close to the fault-line. Virtually none of the households in the census claim that "no one came" in the immediate vicinity of the fault-line. Second, the army's presence does go down with the distance but remains at 60 percent even at its lowest point, confirming its wide leadership in earthquake relief. Third, foreign organizations were a significant presence in the region, but more so close to the fault-line: 40 percent of the residents in villages within 10 kilometers of the fault-line report at least one foreign organization that came to their help.

Similar results holds for the UN group of organizations even though many were not necessarily supposed to be in the role of first responders.

Finally, there have been widespread reports of militant organizations that were active in the region. We classify organizations that are commonly accepted as militant and/or banned from operating in Pakistan under the rubric of militancy.[11] These are *Jamaat u Daawa/Lashkar e Tayyaba, Jaish e Muhammad, Hizbul Mujahidden, Tehreek e Mujahideen, Harkat ul Mujahideen, Al Rashid trust* and *Al Badar Mujahid*. It is important to note that there were a number of other religious organizations such as *Al Khidmat*, the charity arm of the *Jamaat e Islami* that were active in relief-work that are part of the mainstream of the Pakistani political process and are not militant. Figure 3 shows that the presence of the militant organizations at the village level was extremely limited even in villages close to the fault-line—of all organizations, these had the lowest coverage and even at their highest point right next to the fault-line, not more than 10 percent of household report receiving assistance from such an organization.

One organization in particular has gained much notoriety as of late--Jamat-ud-Dawa/Lashkar-e-Tayyeba (a.k.a. LeT). Recognized as a terrorist organization by a number of nations, LeT was suspected as masterminding the Mumbai attacks of 2008. On the other hand, LeT as an organization has been acknowledged for its charity work following the earthquake. In an article written in *The New Yorker*, journalist Steve Coll commented that the organization set up several facilities after the earthquake. The reported data, however, seem to indicate otherwise with regards to the earthquake relief efforts. LeT as an organization visited a total of 23 of the 126 villages in our sample, which may appear impressive, especially for a single organization. However, at the household level, LeT's presence was minimal in the vast majority of such

[11] We should stress that we are not experts on militancy nor was this survey designed to gauge the presence of militancy in the region. The answers to "who came to help" were unprompted and unguided responses given by the households in our census.

villages. In 19 of the 23 villages, 7 or fewer households recalled that LeT was present for relief efforts. All in all, of the 28,297 households surveyed, only 268 households identified LeT's presence in the first three months following the earthquake—161 from a single village. The popular notion of LeT's heavy involvement in relief work following the earthquake is not supported by our data.

There are other highly reputed international and local charitable organizations under the umbrella of Islamic charity such as the international organization Islamic Relief that had a significant presence in the data (7 percent of the households in the census) and should not be lumped together with the militant organizations.

Trust

We first note (Figure 5), perhaps surprisingly, that trust in locals in the earthquake zone, on average, is lower than in foreigners—only 25 percent of respondents say that "people in your village" can be trusted compared to 45 percent for general foreigners. The local trust numbers are almost exactly in line with the results of the World Values Survey. The most interesting variation comes within the earthquake zone as we move closer to the fault-line. In line with our earlier data showing the gradient of foreign presence and distance to the fault-line, the foreign trust variables also increase dramatically as we move closer to the fault-line. Trust in foreigners increases to 60 percent as we move to the immediate vicinity of the fault-line compared to 45 percent 20 kilometers away, and 30 percent 40 Kms away (at which point, trust in locals is *higher* than trust in foreigners). In sharp contrast, *there is almost no relationship between* local trust variables and distance to the fault-line. We attribute the increase in foreign trust as we move closer to the fault-line to the increase in foreign aid and presence of aid workers: The fact that local trust does not change with distance to the fault-line points to the fact that the increase in

foreign trust is not a general disaster effect on attitudes but something that can be attributed to aid itself. Finally, the low absolute level of local trust is both a sign of the fragmentation and stratification of the Pakistan rural environment as well as certain elements of the compensation policy that did create friction within the communities themselves. First, housing compensation was paid on the basis of dwellings rather than households creating friction within extended families as to the division of the funds. Secondly, in determining eligibility for compensation a member of the village was selected to be a part of the three-member team including a member of civil administration and one from the army. There are reports by journalists of tension arising from the need to receive money on time and to be recorded as eligibile for various other grants that were given in the area.

Regression Analysis

Table 3 confirms the strong relationship between foreign presence and distance to the fault-line, justifying our use of the distance variable as a measure of earthquake intensity. Column 1 shows that at the household level, a 10 Km increase in distance from the fault-line decreased the probability of a household reporting that a foreigner came by 4 percent; aggregating to the village-level, this increases to 8 percent (Column 2).[12] Columns 3-5 confirm that distance to the fault-line is the key measure of destruction, both in terms of mortality as well as house destruction. Note that the distance to the epicenter is insignificant and, as we expect, destruction measured through housing collapse was higher in hillier regions as measured through the average slope of the Union Council.

Table 4 documents the first specification relating population attitudes to earthquake intensity. We regress trust in outsiders (defined as those outside the region and not the country)

[12] Foreigners were also more likely to arrive in hillier regions potentially because of the extensive use of helicopters in the affected region.

on the distance to the fault-line, geographical controls and household and individual characteristics. Specifically, Columns 1-4 look at respectively trust in Pakistanis outside the region, Islamic foreigners, general foreigners and European/American foreigners while Column (5) presents the results for the ability to work together variable. We adopt a fairly parsimonious specification, including those variables that have been shown to have an impact on trust in other studies (notably, gender, education and wealth).[13]

There are several noteworthy results. First, men and those who are more educated trust more—this is reassuring since it is in line with results from other studies that use the WVS trust question. Second, trust in all outsiders is strongly (and we claim, causally) linked to distance from the fault-line. The effect of distance to the fault-line variable on outsider trust is large. Trust in Pakistanis outside the region goes up by seven percentage points for every ten kilometer increase in proximity to the fault-line. Trust in general and Islamic foreigners increases by six percentage points for every ten kilometers closer to the fault-line and trust in European/American foreigners by five percentage points. Results are similar for the question on the belief in different groups to work together, which increases by three percentage points for every ten kilometer decrease in distance to the fault-line. Put another way, trust in European /American foreigners goes up by 11 percentage points as we move from the 75^{th} to the 25^{th} percentile of the distance distribution; given the average trust in foreigners is 46 percent, this represents almost a 25 percent increase in trust.

Table 5 shows the sharp contrast with trust in local populations. Here, we present results relating trust in local populations—own village, extended family, own caste/clan and own region—to distance from the fault-line. For all four population groups, there is no relationship

[13] The household wealth index is based on a principal component analysis of the ownership of consumer durables, household appliances and farming implements.

between trust and distance to the fault-line with the measured distance effect close to zero and statistically insignificant. We feel that this difference is strongly suggestive that the increase in the trust in foreigners is not a generalized disaster effect but a direct result of greater help from foreigners into the village. Table 6 replicates these patterns for attitudes measured as belief in the kindness and helpfulness of strangers, although here the results for foreigners are no longer significant.

In Table 7, we introduce as an additional control variable the percentage of the village that reported that a foreigner came to help. There are three critical results. First, there is no change in the relationship between distance the trust in local populations, which remains zero and insignificant. Second, there is no relationship between the intensity of foreign presence and local trust. That is, an increase in foreigner intensity has no impact on trust in locals with the coefficient small and insignificant in all specifications and flipping signs depending on the specific local group that is referenced. In sharp contrast, there is a very strong correlation between the intensity of foreign presence and trust in foreigners—an increase of foreign presence from 0 to 100 increases the trust in foreigners by an incredible 37 percentage points; 32.3 percentage points in the case of Europeans and Americans. The result is similar in nature for the "work compatibility" question, although the magnitude of the effect is somewhat lower. Third, including this additional variable dramatically reduces the relationship between trust in foreigners and distance to the fault-line. In Column 4, the coefficient measuring this gradient reduces by half and the coefficient is barely significant at the 10 percent level. In Column 5, the gradient, which focuses on trust in Europeans and Americans, the gradient is again halved and is now no longer significant. The results are again similar for the work compatibility question. In short, the relationship between distance to the fault-line and trust in foreigners is *largely*

mediated by the greater presence of foreigners in villages close to the fault-line and, at least in correlations, the distance-trust relationship becomes small and insignificant once additional controls for the intensity of foreign presence is included in the specification.

Table 8 presents the instrumental variables specification, which regresses the difference in foreign and local trust on the fraction of village reporting a foreign presence. We instrument our measure of foreigner presence with village-average distance to the fault-line. Columns 1) and 2) present the base specification while columns 3) and 4) add further village controls –the average wealth index and average education level. The coefficient on reported presence of foreign aid is large and significant: increasing the fraction of villagers who report foreign aid by 100 percent would result in an increase of 70-80 percentage points increase in trust.

Tables 9 and 10 present additional results on the differential impact of the earthquake on trust in foreigners for educated (versus uneducated) respondents and for men (versus women). The basic results, seen both in the separate sub-sample regressions (Columns 1,2,4,5,7 and 8) and in the specification with an additional interaction are that there is little heterogeneity in the effect by level of education or gender. The single exception is in the work-compatibility question (Columns 7,8 and 9 in Table 10), which shows that the effect of the earthquake operated only through men with the gradient for women relatively flat with respect to distance from the fault-line.

In sum, the inclusion of additional controls in a multivariate context does not change the basic message from the figures—the earthquake generated an exceptional response from foreigners and foreign organizations, which led to a lasting change in population attitudes for households who benefited from this assistance.

Robustness

Our robustness exercise revolves around three potential sources of biases in our results: the relationship between population attributes and trust; the impact of *non-foreign* assistance on trust and the nature of reporting bias in our measure of the presence of foreign organizations.

Trust and Population Attributes

Risk Aversion

A substantial experimental (both field and lab based) literature studies the relationship between risk aversion and trust; although the general finding from this literature is not conclusive (see for instance, Eckel and Wilson 2004), it is possible that our results could arise from pre-existing differences risk-aversion or the way that that the earthquake changed people's risk attitudes.[14] If the experience of an earthquake increased risk aversion and increases in risk aversion lead to a loss of trust in other locals (relative to outsiders), we would observe the patterns documented above.

In our household survey, we asked respondents to play a hypothetical game (real money was not involved) where they had to select s single scheme from among a menu of risky options. Specifically, we posited that:

> *In every scheme, you have a 50/50 chance of making a small profit or a big profit. Out of these schemes, which one would you choose?*

The options started from a profit of Rs.50 regardless of the draw (0 risk) increasing in risk and return to Rs.0 with 50 percent probability and Rs.200 with 50 percent probability. The options were ordered in an ordinal fashion to represent higher risks. In Table 11, we add in household choices in this game as indicator variables, increasing in their risk attitudes, to the base specification. Note that there is a drop in the number of observations because 25 percent of our

[14] For instance, Ben-ner and Putterman (2001): "Consider next the determinants of trusting. The main factors are A's information about B (and his trustworthiness), A's experience with trustworthiness in other transactions, and A's preferences and dispositions, including but not limited to, her willingness to bear risk."

sample (975 respondents) declined to play the game. Many of them (unrecorded unfortunately) stated to our surveyors that they do not like to gamble and some said that they did not play due to religious reasons as gambling is forbidden in Islam. We treat the missing observations as Missing at Random. Consistent with the idea that risk aversion leads to lower trust, we find that the individuals who chose the riskier options also trust more and that risk aversion is decreasing with distance from the fault-line (independent regression not reported). Importantly, there is no change in overall relationship between trust and the distance from the fault-line, thus ruling out differences in risk aversion as a confounding factor. To what extent could missing observations on risk aversion bias our coefficient from Table 10? We would worry if there was a systematic correlation between the probability of playing the game and distance to the fault-line (with those closer to the fault-line more likely to play), but there is no correlation between these two in an independent specification (although individuals who refused to play the game also reported lower trust—of some interest if we are willing to attribute refusal to play the game to religiosity).

Income

A second alternate hypothesis we worried about was that the trust variable, because of the manner in which the question was posed, could pick up income differences between the respondent and the reference group. That is, suppose that the earthquake (as is very likely) led to a decline in incomes for those closer to the fault-line. When thinking about whether a local person would return the money to the respondent, the respondent could well assume that the local person will have *also* suffered an income shock and therefore will need the money *more* than a foreigner or a person from outside the local region. To the extent that the loss income persisted to 2009, such income differential effects may be salient. Although the earthquake led to substantial destruction and certainly a short-term income loss, because of the unprecedented

relief and reconstruction program, households also recovered quite rapidly—indeed, in related work we find *no* effects of the earthquake on education or health in 2009 (Andrabi and Das, 2010). We confirmed that this recovery extended to consumption levels as well by implementing a full household consumption module and relating per-capita consumption to the distance from the fault-line. Consumption levels in 2009 are uncorrelated to distance from the fault-line in the standard regression specification at all conventional levels of significance (t=1.04). Thus, current income differentials related to distance from the fault-line cannot explain our main result. It is still possible that this mechanism is at play if *lagged* income matters and we cannot rule out this alternate channel. Neither are we able to rule out the possibility that households updated their beliefs about the incomes of foreigners upwards after interacting with them.

General Aid Effects

A third potential bias in our estimates is that the increase in foreigners could have been a result of "aid in general" rather than aid specifically from foreign organizations. That is, closer to the fault-line, villages received more aid an assistance from all types of organizations and not just foreigners. To the extent, that trust in outsiders responded to this aggregate increase in assistance, we may be wrongly attributing the effect of foreign assistance on population attitudes. Table 12 constructs an additional variable measuring the presence of Pakistani organizations at the village level constructed in the same way as the variable measuring the presence of foreign organizations—the fraction of a village reporting Pakistani organizations that came to help. Unlike the foreign aid variable, adding the Pakistan organization does not impact the attitudes towards foreigners. The coefficients are small and statistically insignificant. While adding the foreign aid variable had also made the fault-line effect zero, adding Pakistan aid variables does nothing to the fault-line effect of attitudes towards foreigners. Adding aid from Pakistan

organizations also does not change local trust as almost all organizations from Pakistan were either the Army or organizations from outside the earthquake zone.

Reporting Biases in the Presence of Foreign Organizations

A fourth problem could arise from systematic biases in self-reports. It is worth emphasizing that pure measurement error will lead to attenuation bias, so that our estimates reflect a lower-bound on the true effects. However, if the measurement error is systematically correlated with distance from the fault-line such that—(a) people forget or do not know who provided the assistance *and* (b) those living farther from the fault-line were more likely to forget assistance provided by foreigners relative to those living closer—our coefficient could be biased upwards. To assess whether this is likely, we correlated our measure of foreign presence with another independent question in the survey that asked whether a Chinook (the U.S. helicopter used in the rescue efforts) landed in the village. Among helicopters, the Chinook is distinctive because of its two rotors and respondents were shown a photograph of the Chinook at the time of the survey. The percentage of respondents answering that a Chinook landed in the village is strongly correlated with our measure of foreigner presence at the 99 percent level of confidence in our standard specification with distance to the fault-line (to control for the general provision of aid) and district fixed-effects as additional controls.

Discussion, Limitations and External Validity

The presence of foreigners in the earthquake-affected regions led to a significant change in population attitudes towards outsiders; notably, there was a sharp increase in trust in foreigners as a consequence of the aid effort. Taken at face value, our results also suggest that it was "boots-on-the-ground" rather than media images or financial aid to the government that mattered. If overall aid to the government led to an increase in trust, we should not find the effect

to be strongly correlated to household reports of foreign presence. That trust in foreigners, and European/American foreigners in particular, can be won shows that policy responses by foreign governments and actions taken by international NGOs can win "hearts and minds" and rebuild trust between Pakistan and the West. Whether or not this leads to greater support for U.S. or western policies in the region is hard to answer; encouragingly our results do show that attitudes towards foreigners of people in the earthquake zone are not rooted in deeply held, difficult to move preferences.

Questions about the external validity of these results are important. We demonstrate the effectiveness of a certain type of aid in a particular context in altering population attitudes. The context of a highly correlated shock that ruled-out the possibility of local assistance, and the type of aid—humanitarian assistance delivered on the ground by foreign organizations—is important for our results. Assistance was given to people at a time when they needed it most. It was also given in manner that did not combine strategic with humanitarian objectives: Within hours of the earthquake, U.S. Ambassador Ryan C. Crocker had announced that the U.S. will provide emergency relief funds. Notably absent from Crocker's statement ("*We remain deeply concerned for all affected by this disaster. We are pleased to provide support to Pakistan in the relief effort. We recall with gratitude that when Americans needed help in the wake of Hurricane Katrina, Pakistan stepped forward*",) as well as discussions and debates in the aftermath of the earthquake, was the idea that aid could change hearts and minds, or that changing hearts and minds was an explicit goal of foreign assistance from the U.S. and other donors.[15] It is possible that population attitudes changed *precisely* because this outcome was not a stated objective of the rescue and relief effort. By clearly committing to the aid within hours of the earthquake, Crocker and the U.S. Government's approach allowed respondents to solve the difficult problem of

[15] http://www.reliefweb.int/rw/RWB.NSF/db900SID/EGUA-6H2PD7?OpenDocument

parsing out the strategic versus altruistic motivations for aid-giving in favor of the latter. What that says about the effect of aid in all its different forms, such as government-to-government transfers, is unclear. For instance, would U.S. attempts to help in the great floods of 2010 have a similar impact? It is not straightforward to generalize from the earthquake and evidence of the impact of other forms of aid has never been evaluated. In the absence of any comparable evidence from other types of aid, the argument for a ramped up aid program for flood relief thus trades-off how general these results are versus policy makers' priors on the effects of other types of aid.

References

Alesina, Alberto and Eliana La Ferrara. 2002. "Who Trusts Others?" *Journal of Public Economics, 85*, Pp: 207-234.

Andrabi, Tahir, Natalie Bau and Jishnu Das. 2010. *"Full Recovery: Enrollment and Test Scores Following the Pakistan Earthquake of 2005."* In Process.

Baez, J. E., and I. V. Santos. 2007. "*Children's Vulnerability to Weather Shocks: A Natural Disaster as a Natural Experiment"* Mimeo. Syracuse University.

Ben-Ner and Louis Putterman. 2001. "Trusting and Trustworthiness", *Boston University Law Review* **81** (2001): pp. 523–551.

Bradbury, Mark and Michael Kleinman. 2010. "Winning hearts and minds ? Examining the relationship between aid and security in Kenya," Feinstein International Center, Tufts University

Berman**,** Eli, Joseph Felter, Jacob N. Shapiro. 2009. "*Can Hearts and Minds Be Bought? The Economics of Counterinsurgency in Iraq.*" National Bureau of Economic Research, Working Paper No. 14606, Cambridge MA.

Carpentera, Jeffrey P., Amrita G. Daniereb and Lois M. Takahashic. 2004. "Cooperation, Trust, and Social Capital in Southeast Asian Urban Slums," *Journal of Economic Behavior & Organization*, Volume 55 (4): Pp: 433-551.

Banerjee, Abhijit. 2007. *Making Aid Work.* The MIT Press, Cambridge, Massachusetts.

Bourguignon, Francois and Mark Sundberg. 2007. "Aid Effectiveness—Opening the Black Box." *The American Economic Review*, Vol.97(2). Pp: 316-21.

Coll, Steve. "Lashkar-e-Taiba." The New Yorker 1 Dec. 2008. Available at: http://www.newyorker.com/online/blogs/stevecoll/2008/12/lashkaretaiba.html

Drury, A. Cooper, Richard Stuart Olson, Douglas A. Van Belle, *The Politics of Humanitarian Aid: U.S. Foreign Disaster Assistance*, 1964–1995.

Eckel, Catherine C, and Rick K. Wilson. 2004. "Is Trust a Risky Decision" *Journal of Economic Behavior & Organization*, Volume 55 (4): Pp: 447-465

Fair, Christine and Jacob Shapiro, Winter 2009/10, "Understanding Support for Islamist Militancy in Pakistan."International Security

Fair, C. Christine, Neil Malhotra and Jacob N. Shapiro. 2009. "The Roots of Militancy: Explaining Support for Political Violence in Pakistan."

Fehr, Ernst, Urs Fischbacher, Bernhard von Rosenbladt, Juergen Schupp and Gert Wagner. 2003. "A Nation-Wide Laboratory. Examining Trust and Trustworthiness by Integrating Behavioral Experiments into Representative Surveys." CESifo Working Paper 866.

Glaeser, E., Laibson, D., Scheinkman, J., and Soutter, C. 2000. "What is Social Capital?" *Quarterly Journal of Economics*.

Hanson, M, R Iyengar, J Monten Building Peace: The Impact of Reconstruction Spending on the Labor Market for Insurgents, mimeo, sticerd.lse.ac.uk

Kahn, M.E. 2005. "The death toll from natural disasters: the role of income, geography, and institutions," *Review of Economics and Statistics*, 2005 - MIT Press

Karlan, Dean. "Using Experimental Economics to Measure Social Capital and Predict Real Financial Decisions." *American Economic Review*, December 2005, 95(5), pp.1688-1699.

Knack, Steve and Phillip Keefer. 1997. "Does Social Capital have an Economic Payoff?" *Quarterly Journal of Economics*, 112, Pp: 1251-73.

Knack, Steve and Paul J. Zak. 2001. "Trust and Growth." *The Economic Journal*, Vol.111 (470). Pp: 295-321.

Portner, Claus C. 2009. "Natural Hazards and Child Health," Mimeo, University of Washington

Putnam, R. 1993. Making Democracy Work. Princeton University Press, Princeton, NJ.

Putnam, R. 1995. "Bowling Alone: America's Declining Social Capital." *Journal of Democracy, 6*, Pp: 65-78.

Sapienza, Paola, Anna Toldra and Luigi Zingales. 2008. "Understanding Trust." Mimeo. University of Chicago. Available at:
http://www.kellogg.northwestern.edu/faculty/sapienza/htm/understandingtrust.pdf

Wilder, Andrew, 2008, Humanitarian Agenda 2015 -- Perceptions of the Pakistan Earthquake Response, February,Report, Feinstein International Center, Tufts University

United States Department of State. 2009. "Country Reports on Terrorism." Washington, DC.

Zeckhauser, Richard and Iris Bohnet. 2004. "Trust, Risk and Betrayal", *Journal of Economic Behavior & Organization*, Volume 55 (4): Pp: 467-484

Tables and Figures

Table 1: Descriptive Statistics

Variable	Observations	Mean	Standard Deviation
Distance Fault-line (km)	4670	18.89	15.40
Distance Epicenter (km)	4670	38.60	19.03
Slope (Degrees)	4670	21.39	6.39
Male	4670	0.50	0.50
Fraction with Any Education	4670	0.47	0.50
Fraction with any education (Male)	2324	0.65	0.48
Fraction with any education (Female)	2346	0.28	0.45
Fraction of the village reporting that a Foreign Came (from Household Census)	126	0.25	0.28
Trust: Own Village	4670	0.25	0.43
Trust: Same Biradri/Quam (Caste/Clan)	4670	0.30	0.46
Trust: Same Region	4670	0.17	0.38
Trust: Other Pakistan	4670	0.29	0.45
Trust: Foreigners In General	4670	0.46	0.50
Trust: Europeans or U.S. Foreign	4670	0.48	0.50
Trust: Islamic Foreigners	4670	0.61	0.49
Kindness/Helpfulness: Own Village	4670	0.33	0.47
Kindness/Helpfulness: Same Biradri/Quam (Caste/Clan)	4670	0.36	0.48
Kindness/Helpfulness: Same Region	4670	0.28	0.45
Kindness/Helpfulness: Other Pakistan	4670	0.48	0.50
Kindness/Helpfulness: Foreigners In General	4670	0.54	0.50
Kindness/Helpfulness: European or US Foreign	4670	0.54	0.50
Kindness/Helpfulness: Islamic Foreigners	4670	0.66	0.47
Ability to Work Together	4670	0.40	0.49

Notes: Data are from the 2009 District census and survey of households in 126 villages of 4 districts of the earthquake-affected regions—Abbottabad and Mansehra in the North-Western Frontier Province and Bagh and Muzafarrabad in Azad Jammu Kashmir. Distance from the fault-line and the epicenter is calculated using the 2009 District Household Census and digital maps of the Himalayan Frontal Thrust provided by NESPAK. The slope is the mean slope of the Union Council of the village from digital maps provided by NESPAK. The ability to work together is based on a question asked of a male and female respondent in the household explained in the text. Trust and kindness/helpfulness outcomes are based on a binary variable as defined in the text where higher numbers imply greater trust.

Table 2: Distance to the Fault-line and Exogeneity

	Total Population	Male Population	Female Population	Literacy Rate	Fraction Females Secondary Educated	Village Infrastructure Index
	(1)	(2)	(3)	(4)	(5)	(6)
Distance to Fault-line (km)	-18.38	-9.41	-8.96	-0.02	-0.00	-0.01
	(22.02)	(11.14)	(10.90)	(0.11)	(0.000)	(0.01)
Distance To Epicenter (km)	-12.21	-6.57	-5.64	-0.18*	-0.00	-0.00
	(20.693)	(10.470)	(10.250)	(0.102)	(0.000)	(0.009)
Slope	58.59	28.61	29.98	-0.90***	-0.00**	-0.05***
	(41.593)	(21.044)	(20.603)	(0.205)	(0.000)	(0.018)
District: Bagh	-817.11	-394.72	-422.39	14.79***	0.02	-0.95**
	(1,075.476)	(544.144)	(532.737)	(5.297)	(0.013)	(0.456)
District: Mansehra	1,267.00*	638.55*	628.44*	-17.80***	-0.01*	-0.72**
	(663.066)	(335.482)	(328.449)	(3.258)	(0.008)	(0.281)
District: Muzaffarabad	-2,044.29***	-1,010.67***	-1,033.62***	1.09	0.00	-0.42
	(726.129)	(367.390)	(359.688)	(3.570)	(0.009)	(0.308)
Constant	2,036.30*	1,042.29*	994.01*	74.23***	0.06***	2.34***
	(1,187.380)	(600.762)	(588.168)	(5.833)	(0.014)	(0.503)
Observations	126	126	126	125	126	126
R-squared	0.186	0.182	0.189	0.401	0.143	0.161

Notes: Estimated coefficients are reported from specifications that correlate pre-earthquake village-level characteristics with distance to the fault-line and other geographic controls. Village level data is from the 1998 Population Census. Village Infrastructure Index is the principal component index based on whether a dwelling has electricity, water supply and on construction quality of housing. Distance from the fault-line and the epicenter is calculated using the 2009 District Household Census and digital maps of the Himalayan Frontal Thrust provided by NESPAK. The slope is the mean slope of the Union Council of the village from digital maps provided by NESPAK. The omitted District is Abbottabad. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 3: Aid and Destruction

	Foreign Came (Household Response)	Foreign came (Fraction village reporting)	Mortality	House Damaged or Destroyed	House Destroyed
	(1)	(2)	(3)	(4)	(5)
Distance Fault-line (km)	-0.004***	-0.008***	-0.001*	-0.004***	-0.013***
	(0.000)	(0.002)	(0.001)	(0.001)	(0.002)
Distance Epicenter	0.000	0.002	-0.001	0.000	0.002
	(0.000)	(0.002)	(0.001)	(0.000)	(0.001)
Slope	0.011***	0.007*	0.003**	0.005***	0.014***
	(0.000)	(0.004)	(0.001)	(0.001)	(0.005)
District: Bagh	0.543***	0.057	0.048	-0.002	0.170**
	(0.012)	(0.100)	(0.030)	(0.027)	(0.077)
District: Mansehra	0.208***	0.076	0.032*	0.045**	0.123
	(0.007)	(0.061)	(0.019)	(0.020)	(0.075)
District: Muzaffarabad	0.515***	0.211***	0.053***	-0.002	0.227***
	(0.008)	(0.068)	(0.018)	(0.022)	(0.056)
Constant	-0.098***	0.068	0.019	0.836***	0.278**
	(0.013)	(0.011)	(0.033)	(0.039)	(0.128)
Observations	28,297	126	28297	6455	6455
R-squared	0.336	0.403	0.043	0.058	0.304

Notes: Estimated coefficients are reported from specifications that correlate destruction and mortality arising from the earthquake with distance to the fault-line and other geographic controls. Distance from the fault-line and the epicenter is calculated using the 2009 District Household Census and digital maps of the Himalayan Frontal Thrust provided by NESPAK. The slope is the mean slope of the Union Council of the village from digital maps provided by NESPAK. The mortality data and the aid data are from the 2009 District Household Census and the destruction and damage data from the 2009 District Household Census long form. Standard errors in parentheses, clustered at the village level for household-level regressions (*** p<0.01, ** p<0.05, * p<0.1)

Table 4: Trust in Outsiders after the Earthquake

	Other Pakistani	Islamic Foreigner	General Foreigner	European or American Foreigner	Work Together
	(1)	(2)	(3)	(4)	(5)
Distance Fault-line (km)	-0.007***	-0.006***	-0.006***	-0.005**	-0.003**
	(0.001)	(0.002)	(0.002)	(0.002)	(0.001)
Educated	0.023	0.041**	0.057***	0.047**	0.072***
	(0.016)	(0.017)	(0.020)	(0.019)	(0.018)
Asset Index: Middle	-0.036**	-0.016	-0.019	-0.021	-0.038*
	(0.018)	(0.020)	(0.021)	(0.022)	(0.020)
Asset Index: Poor	-0.061***	-0.024	-0.073***	-0.074***	-0.055**
	(0.021)	(0.026)	(0.026)	(0.027)	(0.024)
Male	-0.005	0.114***	0.076***	0.060***	0.088***
	(0.019)	(0.018)	(0.018)	(0.021)	(0.028)
Distance Epicenter (km)	0.003**	0.002	0.001	0.000	-0.001
	(0.001)	(0.002)	(0.002)	(0.002)	(0.001)
Slope	0.002	0.003	0.002	0.003	0.010***
	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)
District: Bagh	-0.103	-0.173**	0.101	0.061	0.066
	(0.068)	(0.078)	(0.081)	(0.075)	(0.058)
District: Mansehra	0.073***	-0.230***	-0.038	-0.094*	0.034
	(0.028)	(0.056)	(0.042)	(0.049)	(0.042)
District: Muzaffarabad	0.099***	-0.049	0.105**	0.071	-0.025
	(0.036)	(0.061)	(0.049)	(0.056)	(0.052)
Constant	0.257***	0.628***	0.397***	0.479***	0.238***
	(0.062)	(0.098)	(0.087)	(0.097)	(0.078)
Observations	4670	4670	4670	4670	4670
R-squared	0.072	0.090	0.109	0.091	0.074

Notes: Estimated coefficients are reported from specifications that correlate trust in outsiders with distance to the fault-line and other geographic controls. Distance from the fault-line and the epicenter is calculated using the 2009 District Household Census and digital maps of the Himalayan Frontal Thrust provided by NESPAK. The slope is the mean slope of the Union Council of the village from digital maps provided by NESPAK. Other variables from the District Household Survey 2009. Omitted Dummy variables are Asset Index: Rich, District: Abbottabad. The regressions also included a full set of age indicator variables (coefficients not reported). Standard errors in parentheses, clustered at the village level (*** p<0.01, ** p<0.05, * p<0.1)

Table 5: Trust in Locals after the Earthquake

	Own Village	Extended Family	Own Caste, Clan or *Biradari*	Own Region
	(1)	(2)	(3)	(4)
Distance Fault-line (km)	0.000	0.002	0.001	-0.001
	(0.001)	(0.002)	(0.001)	(0.001)
Educated	-0.005	0.026	0.027	0.006
	(0.016)	(0.018)	(0.018)	(0.015)
Asset Index: Middle	-0.020	-0.006	-0.013	-0.014
	(0.018)	(0.022)	(0.020)	(0.016)
Asset Index: Poor	-0.041*	-0.059**	-0.054**	-0.042**
	(0.022)	(0.028)	(0.024)	(0.018)
Male	0.026	0.073***	0.048**	0.023
	(0.018)	(0.020)	(0.020)	(0.015)
Distance Epicenter (km)	-0.001	-0.002	0.000	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Slope	-0.005**	-0.009***	-0.005**	-0.002
	(0.002)	(0.003)	(0.002)	(0.002)
District: Bagh	0.035	0.066	-0.099*	-0.022
	(0.049)	(0.063)	(0.056)	(0.043)
District: Mansehra	0.001	-0.156***	-0.063	0.029
	(0.031)	(0.046)	(0.042)	(0.027)
District: Muzaffarabad	0.080**	0.017	-0.018	0.029
	(0.038)	(0.052)	(0.044)	(0.035)
Constant	0.376***	0.657***	0.425***	0.253***
	(0.065)	(0.088)	(0.076)	(0.053)
Observations	4670	4670	4670	4670
R-squared	0.025	0.046	0.036	0.030

Notes: Estimated coefficients are reported from specifications that correlate trust in locals with distance to the fault-line and other geographic controls. Distance from the fault-line and the epicenter is calculated using the 2009 District Household Census and digital maps of the Himalayan Frontal Thrust provided by NESPAK. The slope is the mean slope of the Union Council of the village from digital maps provided by NESPAK. Other variables from the District Household Survey 2009. Omitted Dummy variables are Asset Index: Rich, District: Abbottabad. The regressions also included a full set of age indicator variables (coefficients not reported). Standard errors in parentheses, clustered at the village level (*** p<0.01, ** p<0.05, * p<0.1).

Table 6: Belief in Kindness/Helpfulness

	Kindness/helpfulness Local			Kindness/Helpfulness Foreign	
	Own Village	Own Caste, Clan or Biradari	Own Region	General Foreigner	European or American Foreigner
	(1)	(2)	(3)	(4)	(5)
Distance Fault-line (km)	0.000	0.000	-0.000	-0.003	-0.002
	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)
Educated	0.008	0.027	0.020	0.048**	0.047**
	(0.017)	(0.017)	(0.018)	(0.019)	(0.019)
Asset Index: Middle	-0.044**	-0.037*	-0.048**	-0.040*	-0.034
	(0.021)	(0.021)	(0.019)	(0.022)	(0.022)
Asset Index: Poor	-0.063**	-0.044*	-0.060***	-0.057**	-0.042
	(0.024)	(0.024)	(0.022)	(0.025)	(0.027)
Male	-0.025	0.001	-0.021	0.049**	0.045*
	(0.020)	(0.020)	(0.019)	(0.024)	(0.023)
Distance Epicenter (km)	0.001	0.001	0.001	-0.001	-0.002
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
Slope	-0.005*	-0.005	-0.003	-0.000	-0.002
	(0.003)	(0.003)	(0.002)	(0.004)	(0.004)
District: Bagh	-0.222***	-0.303***	-0.168***	0.192***	0.172**
	(0.054)	(0.063)	(0.050)	(0.071)	(0.078)
District: Mansehra	-0.111**	-0.185***	-0.041	-0.040	-0.097
	(0.046)	(0.054)	(0.039)	(0.053)	(0.060)
District: Muzaffarabad	-0.041	-0.100*	-0.001	0.145***	0.146**
	(0.045)	(0.053)	(0.034)	(0.055)	(0.061)
Constant	0.513***	0.553***	0.366***	0.570***	0.625***
	(0.071)	(0.085)	(0.064)	(0.096)	(0.109)
Observations	4670	4670	4670	4670	4670
R-squared	0.047	0.062	0.033	0.087	0.092

Notes: Estimated coefficients are reported from specifications that correlate belief in the kindness and helpfulness of different population groups with distance to the fault-line and other geographic controls. Distance from the fault-line and the epicenter is calculated using the 2009 District Household Census and digital maps of the Himalayan Frontal Thrust provided by NESPAK. The slope is the mean slope of the Union Council of the village from digital maps provided by NESPAK. Other variables from the District Household Survey 2009. Omitted Dummy variables are Asset Index: Rich, District: Abbottabad. The regressions also included a full set of age indicator variables (coefficients not reported). Standard errors in parentheses, clustered at the village level (*** p<0.01, ** p<0.05, * p<0.1).

Table 7: Trust Controlling for Aid

	Trust: Local			Trust: Foreign		Work
	Own Village	Own caste	Own Region	General Foreigner	European/ American Foreigner	Together
	(1)	(2)	(3)	(4)	(5)	(6)
Distance Fault-line (km)	0.000	0.000	-0.000	-0.003*	-0.003	-0.002
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)
% Village: Foreign Came	0.013	-0.020	0.061	0.370***	0.323***	0.211***
	(0.054)	(0.062)	(0.044)	(0.062)	(0.060)	(0.059)
Educated	-0.006	0.028	0.004	0.045**	0.037*	0.065***
	(0.016)	(0.018)	(0.015)	(0.019)	(0.019)	(0.018)
Asset Index: Middle	-0.020	-0.012	-0.015	-0.025	-0.027	-0.042**
	(0.018)	(0.020)	(0.016)	(0.020)	(0.021)	(0.020)
Asset Index: Poor	-0.041*	-0.054**	-0.042**	-0.074***	-0.075***	-0.055**
	(0.022)	(0.024)	(0.018)	(0.025)	(0.027)	(0.024)
Male	0.026	0.048**	0.024	0.081***	0.064***	0.090***
	(0.018)	(0.020)	(0.015)	(0.018)	(0.021)	(0.027)
Distance Epicenter (km)	-0.001	0.000	-0.001	0.001	-0.000	-0.001
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)
Slope	-0.005**	-0.005**	-0.002	-0.000	0.001	0.008***
	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)
District: Bagh	0.034	-0.098*	-0.027	0.074	0.038	0.051
	(0.050)	(0.057)	(0.042)	(0.071)	(0.071)	(0.061)
District: Mansehra	-0.000	-0.061	0.024	-0.067*	-0.120**	0.017
	(0.031)	(0.042)	(0.028)	(0.038)	(0.046)	(0.040)
District: Muzaffarabad	0.078**	-0.014	0.016	0.027	0.003	-0.069
	(0.036)	(0.045)	(0.034)	(0.047)	(0.056)	(0.051)
Constant	0.375***	0.426***	0.249***	0.374***	0.458***	0.225***
	(0.066)	(0.077)	(0.053)	(0.077)	(0.089)	(0.075)
Observations	4670	4670	4670	4670	4670	4670
R-squared	0.025	0.036	0.031	0.135	0.111	0.082

Notes: Estimated coefficients are reported from specifications that correlate trust in outsiders with distance to the fault-line and other geographic controls, controlling for our measure of foreign assistance. Distance from the fault-line and the epicenter is calculated using the 2009 District Household Census and digital maps of the Himalayan Frontal Thrust provided by NESPAK. The slope is the mean slope of the Union Council of the village from digital maps provided by NESPAK. Other variables from the District Household Survey 2009. Omitted Dummy variables are Asset Index: Rich, District: Abbottabad. The regressions also included a full set of age indicator variables (coefficients not reported). Standard errors in parentheses, clustered at the village level (*** p<0.01, ** p<0.05, * p<0.1).

Table 8: Difference in Trust: Instrumental Variable Regression

	Difference in Village trust: Local, General Foreigner	Difference in Village trust: Local, European/American Foreigner	Difference in Village trust: Local, General Foreigner	Difference in Village trust: Local, European/American Foreigner
	(1)	(2)	(3)	(4)
Percent Village Reporting Foreigners came	0.884***	0.733***	0.855***	0.707**
	(0.249)	(0.243)	(0.285)	(0.279)
Distance to Epicenter (km)	0.000	-0.000	0.001	0.000
	(0.002)	(0.002)	(0.002)	(0.002)
Slope	0.001	0.002	0.002	0.003
	(0.004)	(0.004)	(0.005)	(0.005)
District: Bagh	-0.013	-0.045	0.010	-0.031
	(0.111)	(0.108)	(0.105)	(0.103)
District: Mansehra	-0.148**	-0.196***	-0.114	-0.171**
	(0.070)	(0.068)	(0.085)	(0.084)
District: Muzaffarabad	-0.184*	-0.190**	-0.159	-0.173*
	(0.095)	(0.093)	(0.099)	(0.097)
Percent Village Educated			-0.097	-0.040
			(0.252)	(0.247)
Village Average Asset Index			-0.032	-0.020
			(0.030)	(0.029)
Constant	0.057	0.140	0.032	0.109
	(0.109)	(0.106)	(0.174)	(0.171)
Observations	126	126	126	126
R-squared	0.233	0.246	0.264	0.266

Notes: The estimates show coefficients from an instrumental variables specification where we use the difference in trust between foreigners and locals as the dependent variable and instrument for the endogenous variable, the percentage of the village reporting that a foreign organization came with the distance to the fault-line. Distance from the fault-line and the epicenter is calculated using the 2009 District Household Census and digital maps of the Himalayan Frontal Thrust provided by NESPAK. The slope is the mean slope of the Union Council of the village from digital maps provided by NESPAK. Other variables from the District Household Survey 2009. Omitted Dummy variables are District: Abbottabad. Standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1).

Table 9: Heterogeneity by Education

	Trust: General Foreigner (Educated Only)	Trust: General Foreigner (Uneducated Only)	Trust: General Foreigner (Full Sample)	Trust: Euro/Amer. Foreigner (Educated Only)	Trust: Euro/Amer. Foreigner (Uneducated Only)	Trust: Euro/Amer. Foreigner (Full Sample)	Work Together (Educated Only)	Work Together (Uneducated Only)	Work Together (Full Sample)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Distance Fault-line (km)	-0.007***	-0.006***	-0.006***	-0.006**	-0.005**	-0.005**	-0.006***	-0.002	-0.003**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.001)
Educated			0.094***			0.066**			0.106***
			(0.032)			(0.032)			(0.027)
Educated* Distance-to-fault-line (km)			-0.002*			-0.001			-0.002**
			(0.001)			(0.001)			(0.001)
Male	0.100***	0.056**	0.078***	0.069**	0.052**	0.060***	0.075**	0.096***	0.089***
	(0.027)	(0.023)	(0.018)	(0.029)	(0.024)	(0.021)	(0.034)	(0.033)	(0.028)
Asset Index: Middle	-0.026	-0.011	-0.017	-0.020	-0.027	-0.021	-0.040	-0.036	-0.037*
	(0.027)	(0.031)	(0.021)	(0.027)	(0.031)	(0.022)	(0.028)	(0.028)	(0.020)
Asset Index: Rich	-0.078**	-0.068*	-0.073***	-0.078**	-0.072*	-0.074***	-0.047	-0.065**	-0.054**
	(0.032)	(0.036)	(0.026)	(0.033)	(0.036)	(0.027)	(0.030)	(0.032)	(0.024)
Constant	0.504***	0.347***	0.386***	0.484***	0.502***	0.473***	0.378***	0.223**	0.228***
	(0.091)	(0.100)	(0.085)	(0.100)	(0.112)	(0.096)	(0.089)	(0.089)	(0.078)
Observations	2173	2497	4670	2173	2497	4670	2173	2497	4670
R-squared	0.123	0.092	0.110	0.093	0.094	0.091	0.073	0.069	0.075

Notes: The estimates show coefficients from a specification where we regress trust in different groups of people on the distance from the fault line for different education groups—in different subsamples in Columns 1, 2, 4, 5, 7 and 8 and as interactions in Columns 3, 6 and 9. All specifications control for the average slope of the Union Council and district dummies as in previous specifications. In addition, all specifications include a full set of age indicator variables. Distance from the fault-line and the epicenter is calculated using the 2009 District Household Census and digital maps of the Himalayan Frontal Thrust provided by NESPAK. The slope is the mean slope of the Union Council of the village from digital maps provided by NESPAK. Other variables are from the District Household Survey 2009. Omitted Dummy variables are Risk Aversion: Greatest, Asset Index: Rich, District: Abbottabad. Standard errors in parentheses, clustered at the village level (*** p<0.01, ** p<0.05, * p<0.1).

Table 10: Heterogeneity by Gender

	Trust: General Foreigner	Trust: General Foreigner	Trust: General Foreigner	Trust: Euro/Amer. Foreigner	Trust: Euro/Amer. Foreigner	Trust: Euro/Amer. Foreigner	Work Together	Work Together	Work Together
	(Male Only)	(Female Only)	(Full Sample)	(Male Only)	(Female Only)	(Full Sample)	(Male Only)	(Female Only)	(Full Sample)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Distance To The Fault-Line (km)	-0.007***	-0.006***	-0.006***	-0.005**	-0.005**	-0.005**	-0.010***	0.003	0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)
Male			0.090***			0.067*			0.233***
			(0.030)			(0.034)			(0.037)
Male* Distance To Fault-line (km)			-0.001			-0.000			-0.008***
			(0.001)			(0.001)			(0.001)
Educated	0.070***	0.040	0.057***	0.044*	0.054*	0.047**	0.073***	0.076***	0.074***
	(0.026)	(0.030)	(0.020)	(0.024)	(0.027)	(0.020)	(0.026)	(0.029)	(0.018)
Asset Index: Middle	-0.032	-0.008	-0.019	-0.026	-0.022	-0.021	-0.036	-0.040	-0.037*
	(0.026)	(0.025)	(0.021)	(0.028)	(0.025)	(0.022)	(0.027)	(0.025)	(0.020)
Asset Index: Rich	-0.076**	-0.070**	-0.073***	-0.080**	-0.070**	-0.074***	-0.055	-0.050	-0.053**
	(0.032)	(0.034)	(0.026)	(0.034)	(0.032)	(0.027)	(0.034)	(0.034)	(0.024)
Constant	0.470***	0.389***	0.390***	0.471***	0.538***	0.475***	0.433***	0.124	0.159**
	(0.093)	(0.100)	(0.087)	(0.104)	(0.108)	(0.097)	(0.106)	(0.095)	(0.079)
Observations	2324	2346	4670	2173	2497	4670	2173	2497	4670
R-squared	0.119	0.110	0.109	0.090	0.091	0.091	0.069	0.061	0.088

Notes: The estimates show coefficients from a specification where we regress trust in different groups of people on the distance from the fault line for men and women—in different subsamples in Columns 1, 2, 4, 5, 7 and 8 and as interactions in Columns 3, 6 and 9. All specifications control for the average slope of the Union Council and district dummies as in previous specifications. In addition, all specifications include a full set of age indicator variables. Distance from the fault-line and the epicenter is calculated using the 2009 District Household Census and digital maps of the Himalayan Frontal Thrust provided by NESPAK. The slope is the mean slope of the Union Council of the village from digital maps provided by NESPAK. Other variables from the District Household Survey 2009. Omitted Dummy variables are Risk Aversion: Greatest, Asset Index: Rich, District: Abbottabad. Standard errors in parentheses, clustered at the village level (*** p<0.01, ** p<0.05, * p<0.1).

Table 11: Trust and Risk Aversion

	Trust: General Foreigner	Trust: General Foreigner	Trust: European or American Foreigner	Trust: European or American Foreigner	Work Together	Work Together
	(1)	(2)	(3)	(4)	(5)	(6)
Distance Fault-Line (km)	-0.007***	-0.008***	-0.006***	-0.008***	-0.005***	-0.003*
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)
Risk Aversion: Middle	-0.057**	-0.082**	0.005	-0.028	0.067***	0.146***
	(0.024)	(0.034)	(0.026)	(0.038)	(0.023)	(0.036)
Risk Aversion: Least	-0.033	-0.089*	0.017	-0.036	0.113***	0.165***
	(0.030)	(0.048)	(0.033)	(0.050)	(0.030)	(0.048)
Risk Aversion: Middle*Distance		0.002		0.002		-0.004***
		(0.002)		(0.002)		(0.002)
Risk Aversion: Least*Distance		0.003*		0.003*		-0.003*
		(0.002)		(0.002)		(0.002)
Asset Index: Middle	-0.011	-0.011	-0.013	-0.013	-0.026	-0.028
	(0.023)	(0.024)	(0.024)	(0.024)	(0.022)	(0.022)
Asset Index: Poor	-0.067**	-0.066**	-0.074**	-0.074**	-0.039	-0.040*
	(0.028)	(0.028)	(0.029)	(0.029)	(0.024)	(0.023)
Male	0.068***	0.068***	0.052**	0.052**	0.089***	0.087***
	(0.019)	(0.019)	(0.022)	(0.022)	(0.031)	(0.031)
Educated	0.065***	0.068***	0.050**	0.052**	0.049**	0.046**
	(0.021)	(0.021)	(0.021)	(0.021)	(0.020)	(0.020)
Constant	0.519***	0.529***	0.593***	0.603***	0.298***	0.282***
	(0.101)	(0.101)	(0.105)	(0.106)	(0.068)	(0.069)
Observations	3695	3695	3695	3695	3695	3695
R-squared	0.124	0.125	0.106	0.107	0.123	0.126

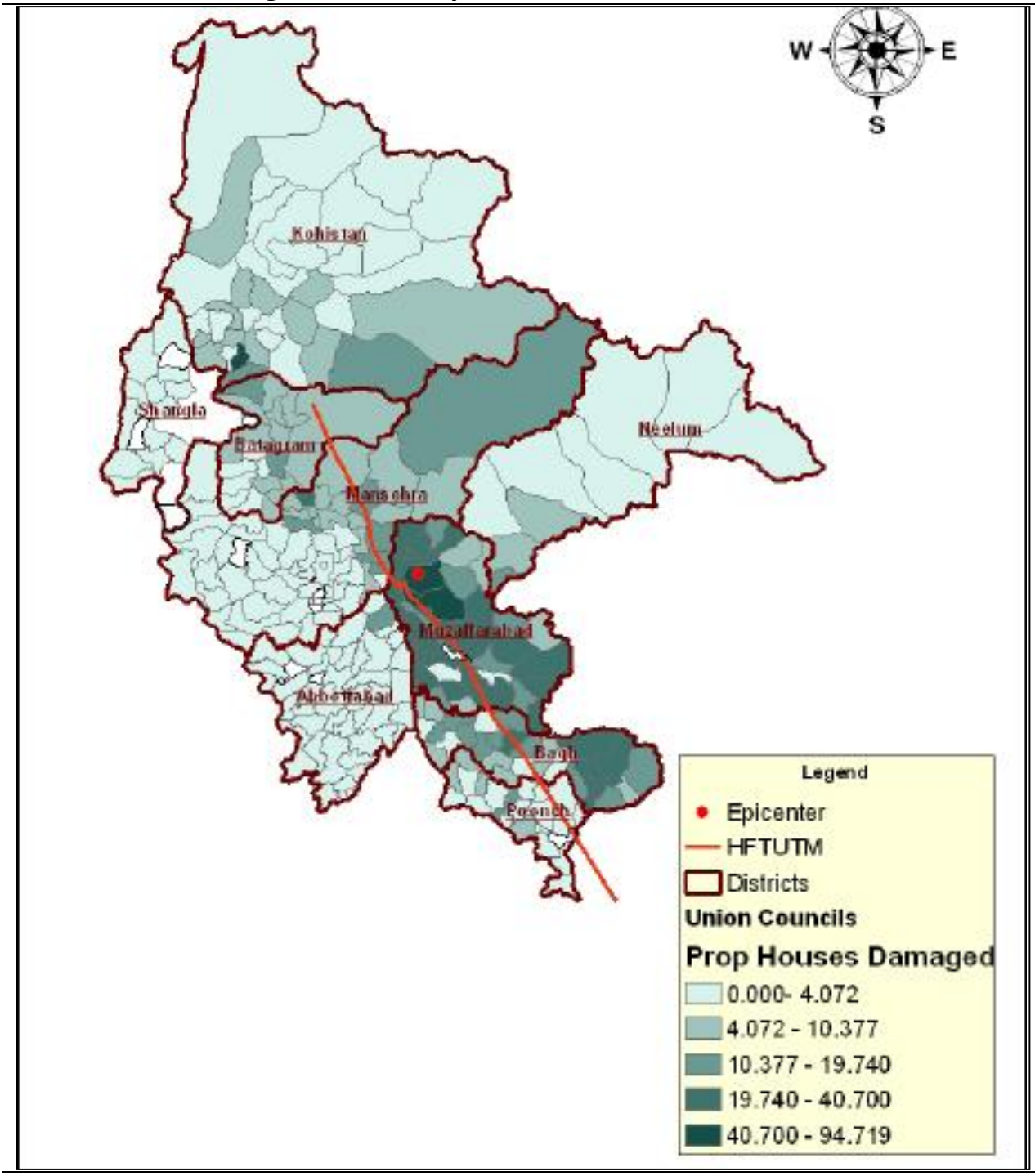
Notes: The estimates show coefficients from a specification where we regress trust in foreigners on the distance from the fault-line and additional controls for risk-aversion, measured as described in the text in Columns 1, 3 and 5 and the interaction between distance and risk-aversion in Columns 2, 4, and 6. All specifications control for the average slope of the Union Council and district dummies as in previous specifications. In addition, all specifications include a full set of age indicator variables. Distance from the fault-line and the epicenter is calculated using the 2009 District Household Census and digital maps of the Himalayan Frontal Thrust provided by NESPAK. The slope is the mean slope of the Union Council of the village from digital maps provided by NESPAK. Other variables from the District Household Survey 2009. Omitted Dummy variables are Risk Aversion: Greatest, Asset Index: Rich, District: Abbottabad. Standard errors in parentheses, clustered at the village level (*** p<0.01, ** p<0.05, * p<0.1).

Table 12: Trust controlling for Aid by Pakistani organizations

	Trust: Local			Trust: Foreign		
	Own Village	Own Caste	Own Region	General foreigner	European or American	Different people can work together?
	(1)	(2)	(3)	(4)	(5)	(6)
Distance Fault-Line (km)	-0.000	0.001	-0.001	-0.006***	-0.005***	-0.003**
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)
Fraction Village Reporting Pakistani Organizations Came	-0.005	0.000	0.004	0.033	0.017	0.042
	(0.027)	(0.031)	(0.021)	(0.034)	(0.035)	(0.039)
Educated	-0.006	0.028	0.006	0.057***	0.048**	0.072***
	(0.016)	(0.018)	(0.015)	(0.020)	(0.020)	(0.018)
Male	0.025	0.047**	0.022	0.074***	0.057***	0.087***
	(0.019)	(0.020)	(0.015)	(0.018)	(0.021)	(0.028)
Asset Index: Middle	-0.021	-0.013	-0.015	-0.017	-0.021	-0.035*
	(0.018)	(0.020)	(0.016)	(0.021)	(0.022)	(0.020)
Asset Index: Poor	-0.043**	-0.055**	-0.043**	-0.069***	-0.074***	-0.053**
	(0.021)	(0.024)	(0.018)	(0.026)	(0.027)	(0.024)
Constant	0.378***	0.423***	0.252***	0.376***	0.468***	0.210***
	(0.064)	(0.074)	(0.053)	(0.087)	(0.096)	(0.077)
Observations	4670	4670	4670	4670	4670	4670
R-squared	0.030	0.042	0.035	0.116	0.100	0.084

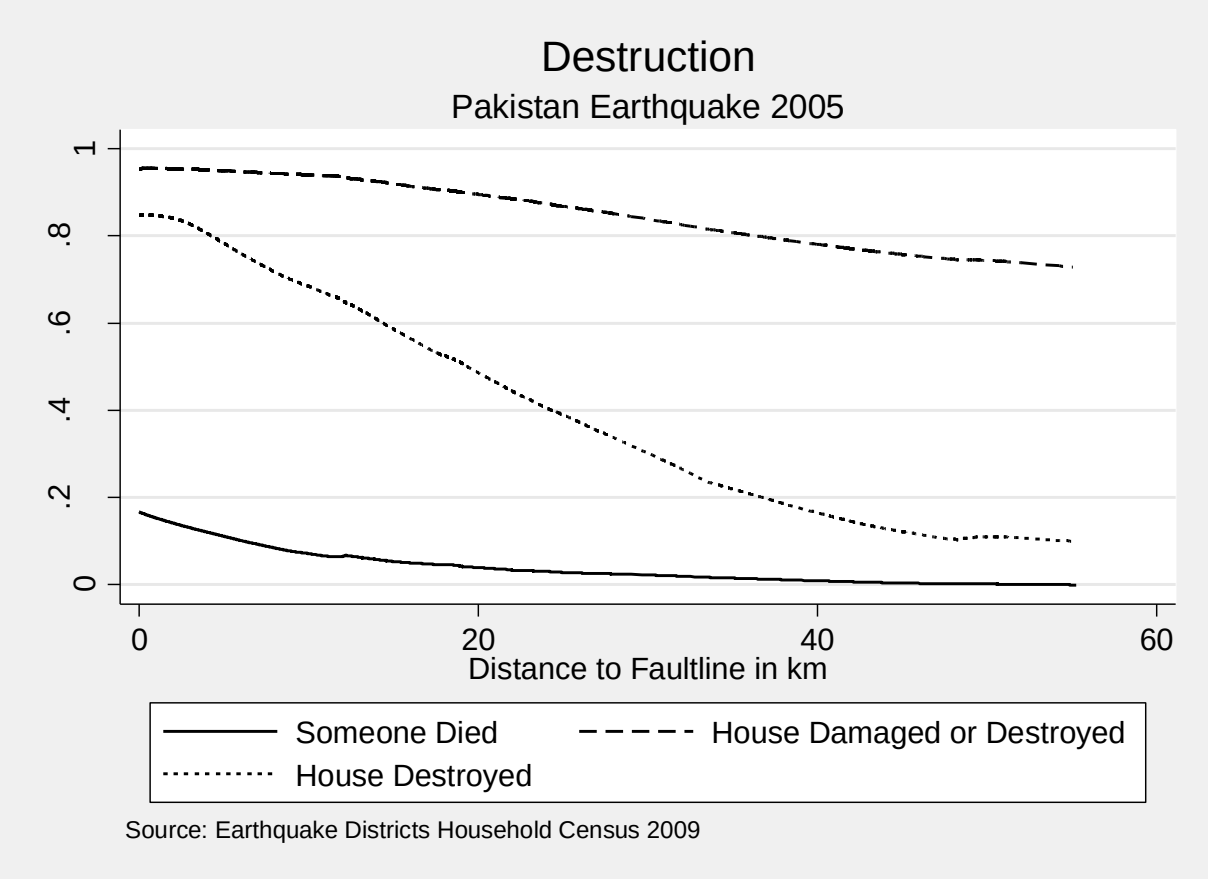
Notes: The estimates show coefficients from a specification where we regress trust in different groups on the distance from the fault-line with additional controls for aid received from Pakistani organizations. All specifications control for the average slope of the Union Council and district dummies as in previous specifications. In addition, all specifications include a full set of age indicator variables: Distance from the fault-line and the epicenter is calculated using the 2009 District Household Census and digital maps of the Himalayan Frontal Thrust provided by NESPAK. The slope is the mean slope of the Union Council of the village from digital maps provided by NESPAK. Other variables from the District Household Survey 2009. Omitted Dummy variables are Asset Index: Rich, District: Abbottabad. Standard errors in parentheses, clustered at the village level (*** p<0.01, ** p<0.05, * p<0.1).

Figure 1: Himalayan Frontal Thrust Fault-line



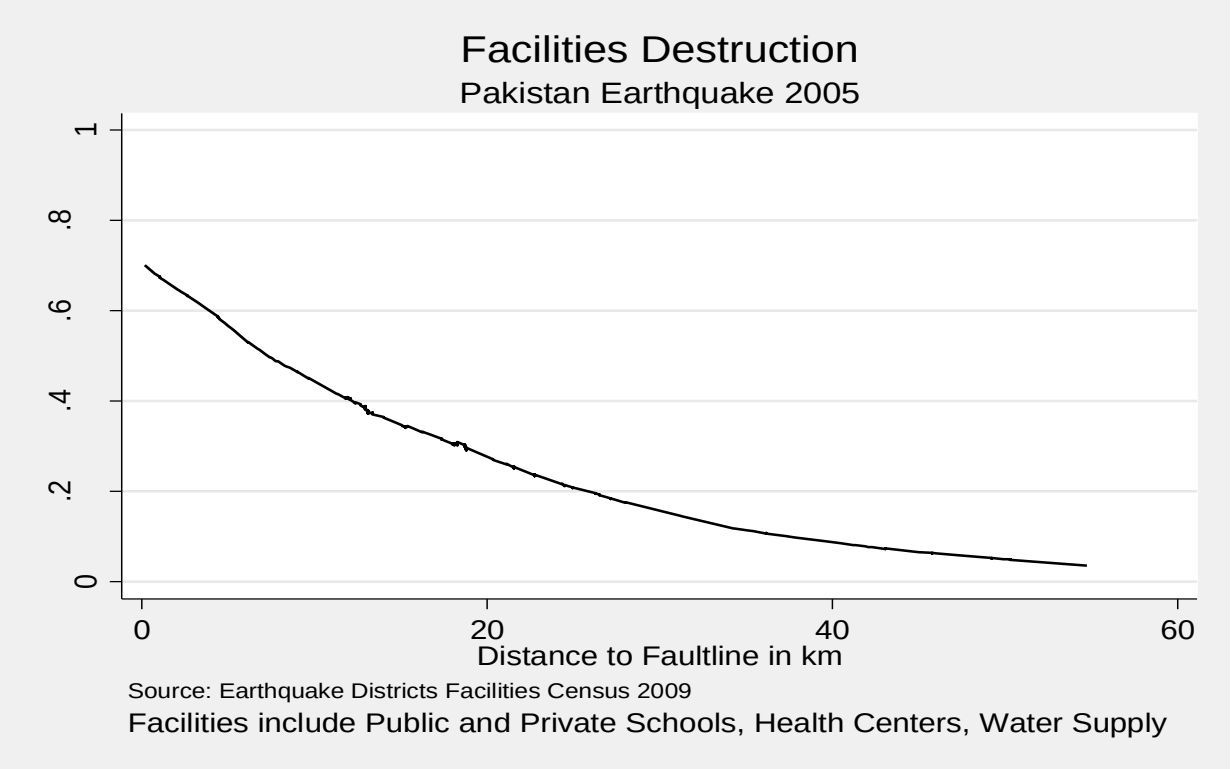
Notes: The digital map of the region, the fault-line and the epicenter are provided by NESPAK. The red line in the figure shows the Himalayan Thrust Fault which was activated during the earthquake.

Figure 2a



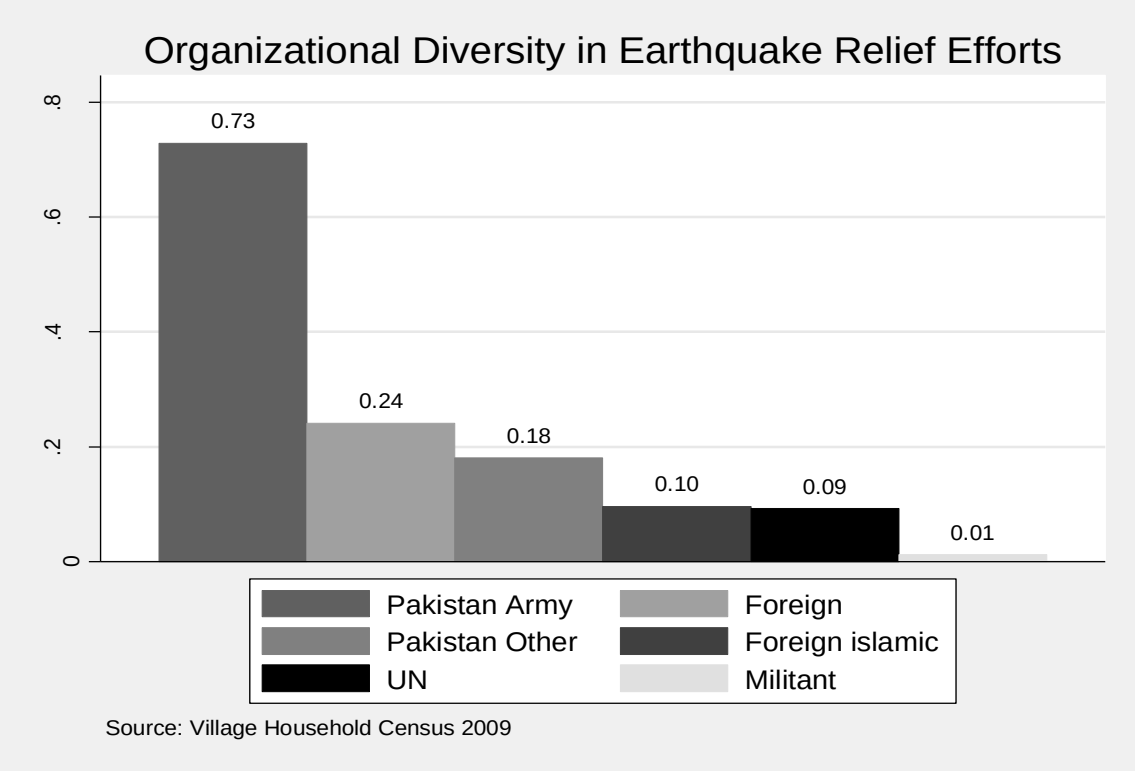
Notes: The figure shows the non-parametric relationship between destruction in the Paksitani earthquake and distance from the fault-line. Distance from the fault-line is calculated using the 2009 District Household Census and digital maps of the Himalayan Frontal Thrust provided by NESPAK. The mortality data are from the 2009 District Household Census short form (28,297 households) and the destruction and damage data from the 2009 District Household Census long form (6455 households).

Figure 2b



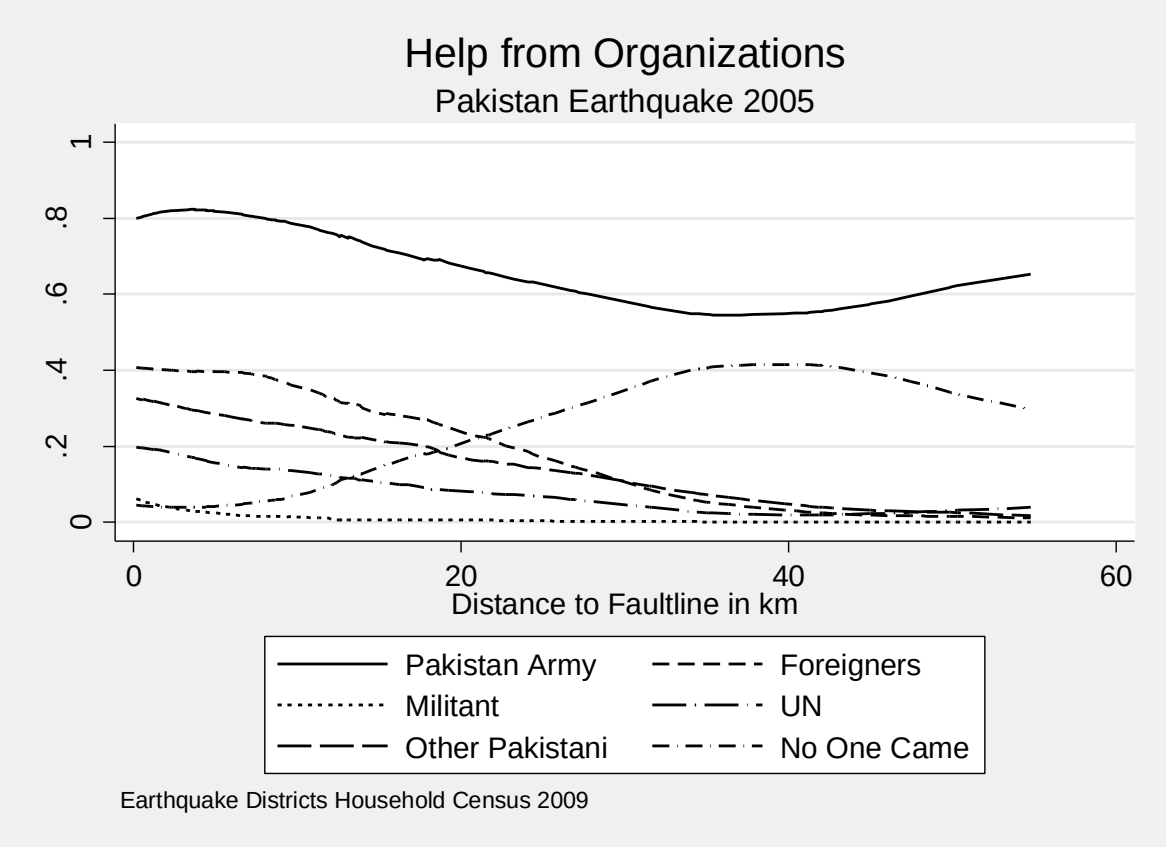
Notes: The figure shows the non-parametric relationship between destruction of facilities in the Pakistani earthquake and distance from the fault-line. Distance from the fault-line is calculated using the 2009 District Household Census and digital maps of the Himalayan Frontal Thrust provided by NESPAK. The facilities data are from the 2009 District Facilities Census.

Figure 3a



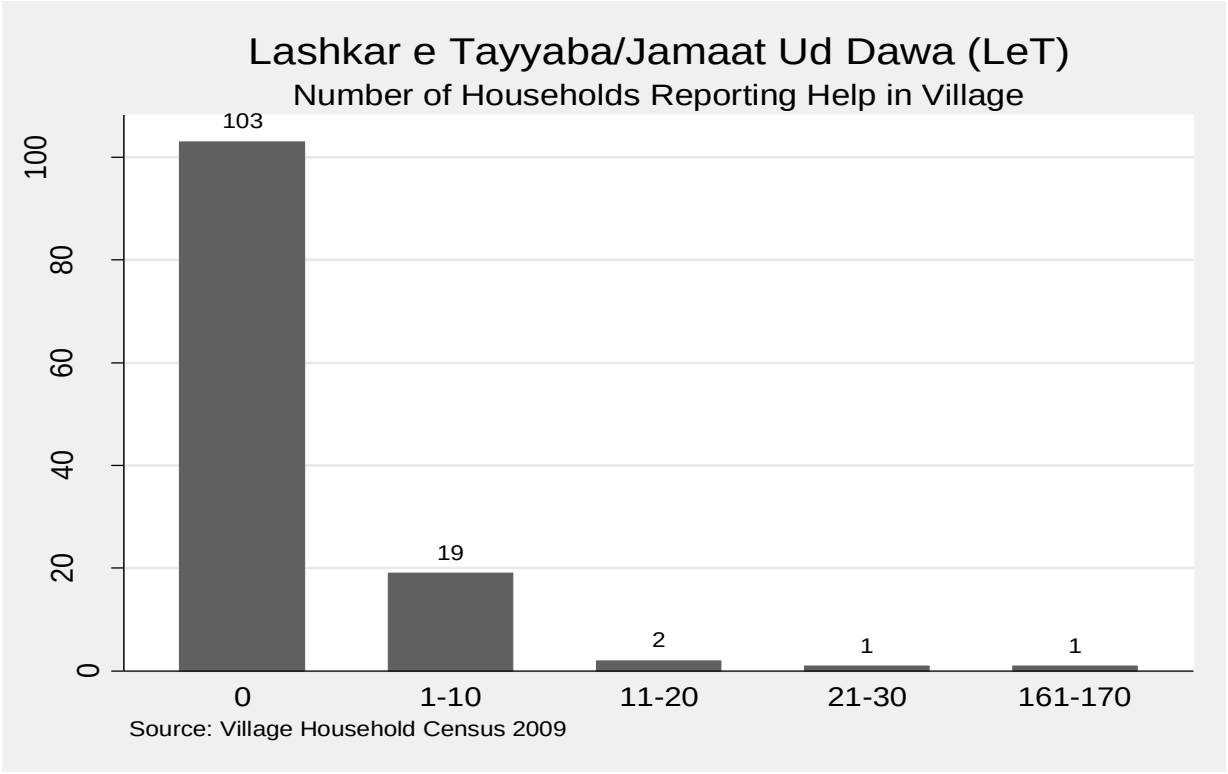
Notes: The figure shows the fraction of households reporting aid in the first 3 months after the earthquake from different types of organizations. For instance, 73 percent of all households mentioned the Pakistan army as one of the organizations that helped them in the aftermath of the earthquake. The data on organizations come from the 2009 District Household Census short form (28,297 households). The bar graph shows the fraction of households who mentioned the specific organization. We asked households to report in an open-ended manner, both the names and the number of organizations who helped.

Figure 3b



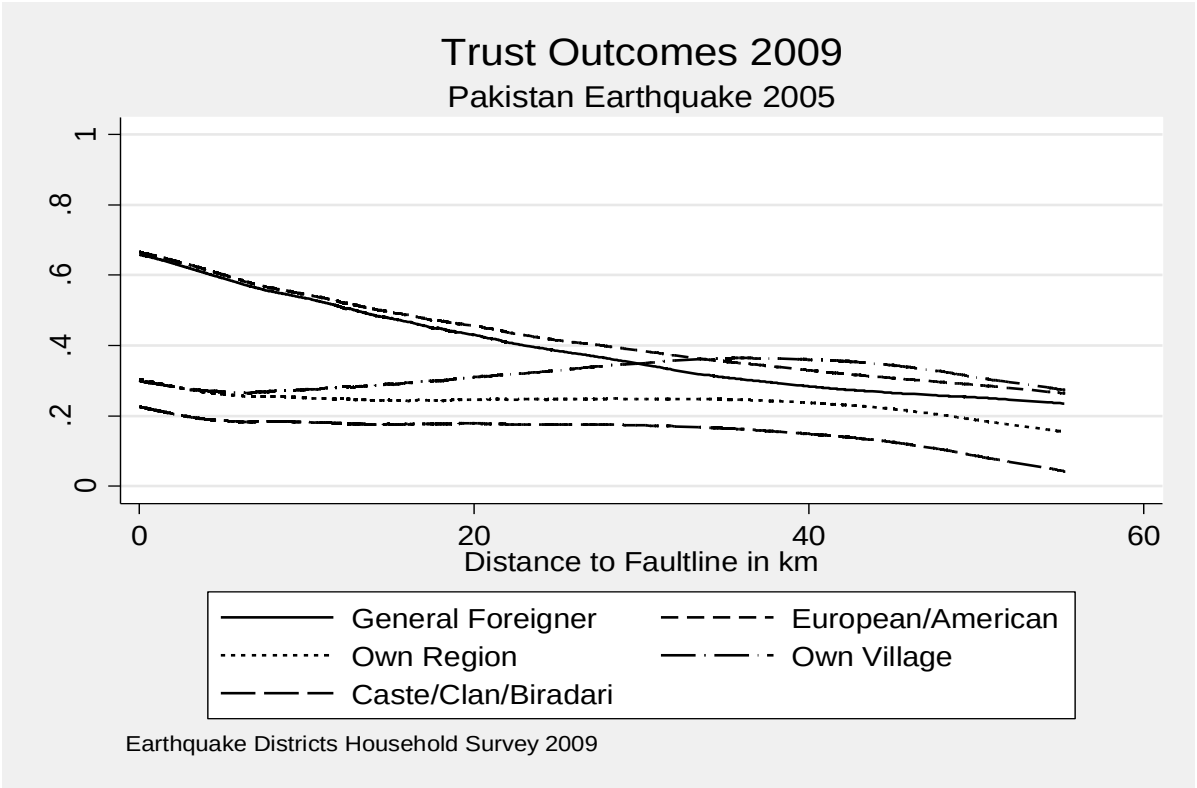
Notes: The figure shows how the fraction of village reporting assistance from any organization changes with distance from the fault-line. Distance from the fault-line is calculated using the 2009 District Household Census and digital maps of the Himalayan Frontal Thrust provided by NESPAK. The organizations data are from the 2009 District Household Census short form (28,297 households).

Figure 4



Notes: The figure plots the number of villages reporting that they were helped by the LeT or Jamaat Ud Dawa in the aftermath of the earthquake, graphed against the number of households reporting help from these organizations in the village. For instance, in 103 villages no household reported receiving assistance from these organizations and in 1 village, between 161 and 170 households reported receiving such assistance. The organizations data are from the 2009 District Household Census short form (28,297 households). The bar graph shows the number of villages where there was no LeT presence (0), where 1-10 households mentioned LeT etc. We asked households to report in an open-ended manner, both the names and the number of organizations who helped.

Figure 5



Notes: The figure plots trust in different groups against the distance from the fault-line. Trust is measured as described in the text. Distance from the fault-line is calculated using the 2009 District Household Census and digital maps of the Himalayan Frontal Thrust provided by NESPAK. The trust data are from the 2009 District Household Survey question to head of household and spouse.

Appendix Tables

A1: Additional Tests using household-survey retrospective data

	Coefficient, Controlling for Distance to Epicenter	Standard Error
	(3)	(4)
Mother Primary Education	-0.000	0.001
Father Primary Education	-0.001	0.002
Distance to Closest Private School Before Earthquake	-0.035	0.025
Distance to Closest Eligible Public School Before Earthquake	-0.022	0.014
Had Electricity Before Earthquake	-0.008***	0.002
Had Inhouse Water Supply Before Earthquake	-0.003	0.002
Minutes to Get Water Before Earthquake	0.052	0.054
Distance to Closest Pump Before Earthquake	-0.004	0.017
Minutes to Closest Medical Facility Before Earthquake	-0.174	0.279
Minutes to Market Before Earthquake	0.133	0.330
Lived in a Permanent Structure Before Earthquake	-0.002	0.002

Notes: The tables shows the estimated coefficients from specifications that regress each of the variables specified against the distance to the fault-line and other geographic controls—the slope of the Union-Council, distance to the epicenter and district-level indicator variables. All specifications are at the household level with standard-errors clustered at the village-level. (*** p<0.01, ** p<0.05, * p<0.1).