

**Biting the Hand that Feeds: An Organizational Theory Explaining  
Attacks Against Aid Workers in Civil Conflict**

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Draft for Princeton Foreign Aid Conference April 2013

**Abstract:**

Why do parties in a conflict ever direct violent attacks against humanitarian aid workers? Despite the fact that most humanitarian aid missions operate under explicit guidelines to remain politically neutral in providing basic resources, aid workers are frequently the targets of violent attacks. To date, there has been no systematic attempt to analyze the determinants of violence against aid workers. In this paper, we argue that the occurrence and variation in attacks against aid workers across civil wars is partially the result of within-group collective action problems. Although warring factions have a long-term collective incentive to exercise restraint in their relationship with humanitarian aid provisions – lest aid organizations withdraw entirely – they are also composed of individual members with private incentives to hijack and divert aid for personal gain. We therefore posit that the likelihood of abuse will depend on at least two important factors related to groups' willingness and ability to solve collective action problems: first, whether sufficient collective incentives exist for armed groups to exercise restraint in anticipation of future punishments (or rewards), and second, whether factions exhibit strong centralized control that enables them to set in place disciplinary structures to identify and sanction opportunistic defections among individual members. We test these expectations empirically using data on the organizational characteristics of rebel groups to predict 1026 acts of major violence reported against aid workers in the period from 1997 – 2010.

## 1. Introduction

The humanitarian effort in Darfur has kept millions of displaced civilians from dying as the result of a civil war that has claimed roughly 400,000 lives since 2003. Yet in 2007, both UN and USAID officials considered withdrawing humanitarian relief as more than a dozen aid workers had been killed, dozens of vehicles stolen, compounds robbed, and aid workers beaten, harassed and sexually assaulted (Polgreen, 2007).<sup>i</sup> Similarly, in January 2010, the United Nations World Food Program suspended food deliveries to one million people in southern Somalia – affecting roughly one third of the total 2.8 million people the program anticipated feeding that year – after attacks killed four staff members in the months immediately prior (Macfarquhar, 2010). Later that year, a Security Council report concluded that as much as half the food aid sent to Somalia is hijacked and diverted from needy people for military purposes and recommended that Secretary General Ban Ki-moon open an investigation into the World Food Program’s roughly \$485 million operation in Somalia (Gettleman & Macfarquhar, 2010). And finally, in Afghanistan last year, at least 100 aid workers were killed – far more than any previous year of the war in Afghanistan – prompting debate within humanitarian organizations about operating in provinces that put them at unnecessary risk (Nordland, 2010).

These attacks, and the subsequent withdrawal of humanitarian aid in conflict areas, suggest an important theoretical and empirical puzzle: why do warring parties in civil conflict ever direct violence against international aid workers? Despite the fact that most humanitarian aid missions operate under explicit guidelines to remain politically neutral in providing basic human needs like food, water, and medical supplies, aid workers are frequently the targets of violent attacks. In the period from 1997 to 2010, there were a total

of 1026 acts of major violence reported against aid workers involving 2129 victims and resulting in 880 fatalities [The Aid Worker Security Database].<sup>ii</sup> The vast majority of these attacks took place in the context of civil conflict (809 attacks, or 80%), where the absolute number of attacks has nearly doubled every three years from 15 incidents reported in 1997 to a high of 163 incidents in 2008 (**Figure 1**).

**[Figure 1 about here]**

On a theoretical level, attacks against aid workers are puzzling because they have the potential to be extremely costly for warring parties. In addition to the immediate logistical and material costs associated with planning and executing attacks, warring parties can expect to incur more substantial long-term costs if aid provisions are withdrawn altogether. Indeed, as the cases above illustrate, aid organizations and international donors have demonstrated a consistent willingness to suspend relief operations in response to aid diversions and perceptions of operational insecurity, thereby denying rebels access to future aid provisions altogether.<sup>iii</sup> Perhaps even more costly is that the withdrawal of humanitarian assistance risks undermining combatants' base of support among the local civilian population – the primary recipients and largest beneficiaries of relief provisions. To the degree that warring parties generally depend on civilian populations to supply the labor and resources needed to wage a successful civil war (including strategic advantages like mobility and invisibility), a strategy of attacking aid workers for resources in the short-term appears to be suboptimal given their long-term interests in maintaining popular support.

Even more puzzling is the empirical variation in attacks across different regions and conflicts. **Figure 2** plots the total number of aid worker attacks from 1997-2009 disaggregated by region. Overall, 54% of aid worker attacks in this period occurred in civil wars in Africa, while 28% of occurred in civil wars in Asia. Far fewer attacks occurred in civil conflicts in the Middle East (9%), Europe (5%) and North and South America (4%). Much of this variation might be explained by the fact that there are far more civil conflicts in Africa and Asia than in the other three regions of the world, but **Figure 3**, which plots the percentage and overall number of civil conflicts in which an aid worker was attacked each year, demonstrates that there is substantial variation even across countries undergoing civil war. For example, aid worker attacks occurred in only eight of the 40 ongoing civil wars (20%) in 1997. However, the percentage of civil wars in which there was an attack steadily increased over time, peaking at roughly 58% of all civil conflicts in 2006 before settling at 50% in 2009.

**[Figure 2 about here]**

**[Figure 3 about here]**

Beyond the theoretical puzzle of why parties would ever attack aid workers at all, then, this empirical variation is especially puzzling because we might expect parties across different civil conflicts to have identical incentives with respect to hijacking and diverting humanitarian assistance. Yet, as the data above suggests, warring parties appear to exhibit very different patterns of behavior with respect to aid workers and the assistance they

provide. One might suspect that these differences are simply attributable to the overall intensity of the war, but the most comprehensive description of aid worker attacks to date has found little empirical relationship between the overall level of violence and the total number of aid worker attacks (Stoddard, Harmer & Haver, 2006).

In this paper, we propose a theory of aid worker attacks to explain the variation in attacks across conflicts and over time. Unlike most theories of violence in civil war, which tend to conflate the collective incentives of rebel groups with the private incentives of the individual combatants that comprise them, we argue that attacks against aid workers are often the result of within-group collective action problems. Although warring factions have a long-term collective incentive to exercise restraint in their relationship with humanitarian aid provisions – lest aid organizations withdraw entirely – they are also composed of individual members with private incentives to hijack and divert aid for personal gain. We therefore posit that the likelihood of abuse will depend on at least two important factors related to groups' willingness and ability to solve this collective action problem: first, whether sufficient collective incentives exist for armed groups to exercise restraint in anticipation of future punishments (or rewards), and second, whether factions exhibit strong centralized control that enables them to set in place disciplinary structures to identify and sanction opportunistic defections by individual members.

We test these expectations empirically using data on the organizational characteristics of rebel groups across conflicts and find strong support for our argument. We find that rebel groups that operate a political wing are much more likely to exercise restraint compared to groups that lack the same collective incentives to avoid the political costs associated with the withdrawal of aid. Moreover, we also find that members of more

organized rebel groups which exercise a stronger degree of territorial control are much less likely to opportunistically attack aid workers when compared to combatants in less organized groups that lack the same ability to monitor and enforce restraint among individual members.

Before proceeding, it is important to note at the start that we do not intend to develop a *complete* model to explain 100-percent of the variation in attacks against aid workers (if this is even possible). Instead, we aim to propose a novel theory that yields testable hypotheses about how variation in the organizational structure of rebel groups can influence combatants' incentives to attack aid workers in ways that may not be immediately obvious to analysts and aid practitioners. In doing so, we knowingly leave aside the very real possibility that attacks against aid workers are often times strategically motivated (Narang and Stanton 2013).<sup>iv</sup> Unfortunately, no single article can fully identify all of the factors that influence a given empirical outcome.<sup>v</sup> However, just because attacks against aid workers may be motivated – in part – by strategic factors does not mean that they are not also affected by organizational factors as well. Indeed, both sets of risk factors may systematically explain separate *parts* of the empirical variation – which is to say they are not mutually exclusive.<sup>vi</sup> In the end, we choose to focus on organizational factors here because we believe the strategic incentives to conduct violence against non-combatants have received considerable attention elsewhere (Valentino et al, 2004; Downes, 2008; Stanton 2009).

The remainder of this paper proceeds in four principle sections. In the next section, we outline an organizational logic of rebel groups from which we derive testable implications about the conditions under which aid workers are more or less likely to experience an attack.

Section 3 describes the research design and data used to test our hypotheses and Section 4 discusses the main findings. The final section concludes.

## **2. A Theory: Collective Action, the Structure of Rebel Organizations, and Attacks Against Aid Workers**

In this section we aim to articulate a view of rebel groups as organizations that face a variety of collective dilemmas that must be solved in order to operate effectively. In doing so, we follow in a long tradition of scholarship that effectively models a rebellion as a team of laborers specializing in the production of violence with the common goal of capturing a share of the rents that come from exercising political authority (Lichbach, 1998; Olson, 1971; Popkin, 1979). Because the remainder of this paper deals with propositions that follow from the general topics of collective action problems and organizational design, it is useful to quickly review these ideas before applying them to rebel groups and their relationship to humanitarian assistance.

A collective action problem is a situation in which rational behavior on the part of individuals can lead to unanimously dispreferred outcomes (Olson, 1971). More formally, collective action problems are situations that can be modeled as a game possessing Pareto-inefficient Nash equilibria, as in the famed prisoner's dilemma where players have a dominant strategy to defect on the cooperative outcome.<sup>vii</sup> The result in these situations is in an inefficient equilibrium where all players pay the relative costs associated with defection – even though they could be made better off through cooperating – because they cannot trust the other players not to defect. Such dilemmas are thought to characterize several common



social interactions and are thus used to explain ‘suboptimal’ levels of cooperation in many domains, particularly those that involve the under-production of collective goods.

One key reason collective action problems are important is that they form the basis for what is perhaps the most comprehensive theory of institutional origins and design. Most clearly articulated as the Alchian-Demsetz theory of the firm, and part of the broader perspective of new institutional economics, the theory seeks to explain institutional origins and features in terms of the choices made by rational individuals facing collective dilemmas (Alchian & Demsetz, 1972). In this view, institutions often emerge in order to solve collective action problems endemic to team production through the establishment of a central authority whose occupant(s) has a personal incentive to ensure that the collective dilemma is overcome. This “entrepreneur” is distinguished by three essential features: (1) he bears the costs of monitoring the organization facing the collective dilemma in order to prevent shirking by individuals, (2) he possesses selective incentives with which to reward those he finds cooperating and punish those he finds defecting (e.g. hiring and firing individuals), and (3) he is compensated for the services he provides (Cox & McCubbins, 1993). Centralized agents of this kind are appointed (emerge) when purely voluntary agreements cannot be relied on to solve the collective action problems in team production.

To illustrate this logic more concretely, consider the well-known example of the Yangtze rivermen used to depict an institutional solution to a quasi-prisoner’s dilemma. As retold by Cox and McCubbins (1993),

In prerevolutionary China, large gangs of men would tug fair-sized boats up the Yangtze. The problem was that each man was tempted to slack off a bit. After all, if

enough others were pulling, the boat would still progress; if too few others were pulling, it did not matter how hard one pulled anyway. (p.92)

The rivermen's situation presented a collective dilemma: the Nash equilibrium was for no one to pull at all, for if one figured the other rivermen would pull (cooperate) then it was unnecessary to contribute his own effort in order to get the boat across and be paid. And, if one expected the other rivermen would all not pull (defect), it would again be unnecessary to pull because the effort of just one person in moving the boat would be futile. According to Cheung, the problem of loafing among the Yangtze rivermen became so severe that they actually agreed to the hiring of someone to whip them in order to ensure that everyone both pulled and got paid (Cheung, 1983).

It is this general logic that we wish to apply to the origin and structure of rebel organizations. Rebels face a directly analogous situation to the one described above: they share a collective dissatisfaction with the existing government and the common goal of gaining policy concessions from the state. However, producing the level of violence needed to effectively coerce concessions from the state requires a team effort saddled with the same problem of shirking faced by the Yangtze rivermen. Individually, the effort of any single combatant is futile, but collectively each one has the incentive to defect from taking costly action to contribute his own effort to the group (Taylor, 1988). As in the case above, the Nash equilibrium is for no one to contribute their individual effort towards production of the common goal, which is inefficient because each would prefer the outcome in which they all contributed their effort to the rebellion and, together, coerced concessions from the state.

It is worthwhile to note that the incentives to defect in this case are particularly acute because the costs to individual combatants for collaborating in a joint rebellion go well

beyond those of the Chinese riverboat pullers. Individual combatants must not only pull their own weight with respect to fighting the government, they must also conform to a host of other costly practices designed to maximize team production, including abiding by onerous membership requirements (Gates, 2002) and exercising restraint towards the civilian population once armed (Humphreys & Weinstein, 2006). This latter point is especially important because rebel groups typically depend on civilian populations to supply the labor, resources, and strategic advantages like mobility and invisibility, needed to wage a civil war (Valentino, Huth & Balch-Lindsay, 2004). Indeed, it is generally well accepted that the success of an insurgency turns on the popularity of insurgents within their local population, for, as Mao famously noted, “the guerrilla must swim in the people as the fish swims in the sea”.

Yet, for as critical as maintaining the hearts and minds of the civilian population may be to the overall success of a rebel group, individual armed combatants have the incentive to defect from exercising restraint and use coercive tactics to extract resources like food, labor, and property for private gain. Of course, if one combatant expects all others to not exhibit restraint (defect), it becomes unnecessary (and inefficient) to show restraint oneself since realizing the collective goal of challenging the state is impossible if everyone defects and alienates the civilian population. The fact that individual combatants must agree to not only collaborate on the production of violence but also on exercising restraint towards the civilian population thus presents a collective dilemma.

And indeed, the problem of defection among individual combatants is generally so severe that combatants agree to the formation of a centralized command to “whip” them in order to ensure everyone contributes. This is because, although rebels could, in theory,

agree to collaborate on taking the costly actions necessary to effectively challenge the state through a series of voluntary agreements, the individual incentive for each combatant to later defect – by free riding on the efforts of others – leads them to appoint a leadership that bears the direct costs of monitoring and sanctioning defectors within the group. These tasks are typically accomplished with a set of selective incentives designed to reward cooperative members and punish defectors. Rebel leaders exercise these rights by “hiring” or “firing” individual rebels and by negotiating their compensation. In exchange for providing these services, rebel leaders either claim a substantial share of the group’s collective output or they have a residual claim to all profits once all members have been compensated. Thus, the collective action problem facing members of a rebel group can be solved by institutionalizing a central authority motivated to ensure members do not defect.

It is now straightforward enough to leverage this general theory to explain the particular phenomenon of interest in this paper: attacks against aid workers. Recall from our introduction that it was not immediately obvious why the provision of humanitarian assistance would ever become the target of rebel attacks, especially since aid can be expected to enter into a rebels’ production function for violence by directly supplying insurgents with access to resources over the long term, and by indirectly preserving ties to civilian sources of support (supplies, shelter, moral legitimacy, etc.). For our answer, we relax the assumption that rebel groups are unitary actors with perfect coherence of collective purpose and, instead, model them as organizations that emerge from the voluntary interaction of individual combatants.

We propose that attacks against aid workers are often the result of within-group collective action problems. Although warring factions have a long-term collective incentive

to exercise restraint in their relationship with humanitarian aid provisions, they are also composed of self-interested individuals with private incentives to opportunistically hijack and divert aid for private gain. Here a collective dilemma arises because, while it is the dominant strategy for each individual combatant to attack and hijack aid caravans, if too many attacks against aid workers occur, rebels risk the withdrawal of aid organizations altogether and fracturing ties with the local community, who are the primary recipient of humanitarian assistance. For individual combatants to exercise restraint with respect to easily-lootable aid provisions thus requires collaboration among rebels.

A solution, as in the case of the Yangtze rivermen, is to institutionalize a central authority that is both *willing* and *able* to ameliorate the collective dilemma by taking costly action to monitor and punish defections among individual combatants. With respect to the latter condition, it is reasonable to expect that members of more organized rebel groups that have empowered stronger central commands will be much less likely to opportunistically attack aid workers (defect) when compared to combatants in less organized groups that lack the same internal mechanisms to monitor and enforce restraint among individual members.

*Hypothesis 1: The greater the degree to which a central command exercises control over participants in a rebellion, (a) the lower the likelihood that an aid worker will be attacked in that civil conflict, and (b) the lower the total number of attacks will be in that civil conflict.*

But note that while combatants may be *able* to collectively monitor and sanction individuals for opportunistically shirking on their obligations to the group, the degree to which they themselves, or an appointed agent, are actually *motivated* to take costly action in enforcing this punishment depends, in part, on having shared beliefs about the expected costs of not achieving the common goal (i.e. gaining concessions from the state) relative to

benefits of defecting. For example, the Yangtze rivermen were *motivated* to hire someone to whip them because they each shared a preference for the cooperative outcome in which they all pulled and got paid rather than the outcome in which they all loafed (saving their effort) but did not get paid. Likewise, their agent was *motivated* to expend time and effort in whipping them by a personal interest in collecting the profits that came from promoting efficient collective action rather than slacking. Thus, the relative costs of ending up in the inefficient Nash equilibrium were sufficiently high and sufficiently clear to everyone involved in the production that they were willing to create and institutionalize a solution.

With respect to the combatants' relationship to aid provisions, it follows that the greater the expected costs of the inefficient equilibrium (in which combatants defect by attacking aid workers for private gain) relative to the cooperative outcome (in which they exercise restraint for the sake of maintaining the popular support necessary to effectively coerce concessions from the state), the more motivated group members will be to implement a solution to the collective dilemma. While there are many different factors that could influence how costly it might be to a rebel group if individual combatants defect and attack aid workers, here we focus on one specific condition: whether a rebel group operates a political wing. Following the logic above, we expect that rebel groups that operate a political wing will be much more motivated to ensure restraint among their members compared to groups which lack the same collective incentive to avoid the political costs associated with the withdrawal of aid. We formulate this expectation based on the assumption that rebel groups operate a political wing for a reason: presumably, their members have collectively agreed to challenge the state using a combination of non-violent political channels and coercive bargaining through battlefield outcomes (Heger 2010). For this reason, we expect rebel groups that operate a political wing to be much more sensitive

to the possibility of alienating the civilian population and losing political support if aid provisions are withdrawn due to attacks.

*Hypothesis 2: The likelihood of an aid worker attack will be significantly lower in civil conflicts where a rebel group maintains a political wing compared to conflicts in which a rebel group does not maintain a political wing.*

In the next section, we outline the research design we use to test these empirical expectations. We start by introducing the data for our main independent and dependant variables and then describe the estimation technique used to analyze our hypotheses. To foreshadow the results, we find that the dramatic variation in attacks against aid workers across different conflict areas can be partially explained by differences in the capabilities and incentives of rebel groups to solve the collective action problem outlined above. Specifically, we show that in civil wars where rebel groups are more organized, with a strong central command, and in civil wars where rebel groups operate a political wing, aid workers are much less vulnerable to attacks.

### **3. Data and Methodology**

Because the theory outlined above links variations in the organizational structure of rebel groups with attacks against aid workers, an ideal empirical strategy might begin with rebel groups as the unit of analysis and attempt to explain cross-sectional variation in attacks committed by each group using data on their capabilities and political opportunities as independent variables. Unfortunately, it is often impossible to identify which rebel group perpetrated the attack in each event. This is because, much like terrorist attacks, violence

against civilians, or even common crimes/banditry, observers on the ground do not always know who was responsible for the violence and why – they simply observe the aftermath (Stoddard et al., 2006). Moreover, rebel groups often have the incentive to deny responsibility for attacks when they think it will be costly to claim, which means that any data attributing aid worker attacks to a particular group is sure to be controversial.

To avoid complications that would arise from attributing individual attacks, the unit of analysis for this study is the civil war year. We defined the population of cases using the UCDP Armed Conflict Data, which contains a list of all civil war years from 1945-2010. We dropped all conflict years from the ACD data before 1997, leaving us with a study population of 457 civil war-year observations that occurred in 83 different civil wars between 1997 and 2009.<sup>viii</sup> We then merged the data on our dependant variable – attacks against aid workers – onto each conflict year, matching the country-location and year of each aid worker attack with the Correlates of War identifier of the country in which fighting primarily occurred.

### **3.1 Data**

For data on aid worker attacks, we used the Aid Worker Security Database, which collects incident reports from public sources augmented with internal information provided directly by aid organizations. The dataset is a compilation of reports on major security incidents – defined as killings, kidnappings, and armed attacks that result in serious injury – involving deliberate acts of violence affecting aid workers (Stoddard et al., 2006). Aid workers are defined as “employees and associated personnel of not for profit aid agencies (both national and international staff) that provide material and technical assistance in humanitarian relief contexts”.<sup>ix</sup> This includes employees of both relief and multi-mandated



(relief and development) organizations.<sup>x</sup> Not included are UN peacekeeping personnel, human rights workers, election monitors or purely political, religious, or advocacy organizations.

The full version of the Aid Worker Security dataset downloaded for this article contained a total of 1026 attacks on aid workers recorded during the period from 1997-2010.<sup>xi</sup> Of these, 809 attacks (79%) occurred in the civil war years included in our study population. And of the reported 2129 total victims from these attacks in the full dataset, 1726 of the victims (81%) were observed in conflict-years included in our study. The other 217 attacks against aid workers and 403 aid worker victims were excluded because they occurred outside the context of a civil war either in an international conflict or a natural disaster.

For data on our main explanatory variables, we used the Expanded Uppsala Armed Conflict Data (EUACD) (Cunningham, Gleditsch, and Salehyan 2009). These data expand on the original Uppsala Armed Conflict Data on civil conflicts in two important ways. First, the data codes specific information about the *non-state actors* involved in a civil conflict, such as the estimated size of the rebel group, whether a rebel group has a clear central command, whether a rebel group controls territory, or whether a rebel group has a political wing (in addition to many other attributes). Second, the data adds information about the *external dimensions* of civil conflicts, including access to external support and extraterritorial features. For example, the data codes for whether a particular rebel group was supported by another government or transitional non-state actor in either a military or non-military manner.

The variables within these data that are of primary interest for our study are the indicators we chose to proxy for the constructs ‘degree of central command’ and ‘maintains

a political wing'. To measure the first – the degree to which a centralized authority can monitor and sanction opportunistic defections among individual members of a rebel group, and thus potentially solve the collective action problem that contributes to attacks against aid workers – we use an ordinal coding of the variable *efferrcont* in the EUACD data, which measures the degree of effective control a rebel group exercises over the territory in which it operates. While this measurement is, at best, only a proximate indicator of the degree of centralized authority in a rebel group, it has been used in previous work to measure rebels' capacity to enforce discipline (Humphreys & Weinstein, 2006). Moreover, this measure is much more refined than the alternative, dichotomous indicators for the strength of central command available in the dataset. Finally, to measure the second construct – whether a rebel group has a political wing, and thus the added incentive to police defections in order to avoid the political costs of alienating the local population – we use the dichotomous variable *rebpolwing*, which directly codes for whether the group is known to operate a political wing in that conflict-year.

Before moving to a discussion of our analysis and results, there is an important concern with using these data that are worth noting. Following the original Uppsala Armed Conflict data, the unit of analysis for the expanded non-state actor data is the conflict dyad, where a single conflict is distinguished by a non-state actor (Side B) fighting the government (Side A). Importantly, because a civil conflict may have many side B actors that each forms a separate conflict dyad with the government, we were forced to make a coding choice in terms of which group's attributes to merge onto the single observation for that conflict year in our study. For example, Conflict 1360 in the expanded armed conflict data between Guatemala and five insurgent groups—MR-13, FAR, EGP, PGT, and ORPA – gives rise to five separate dyadic conflicts for which individual information was collected. All told, there

are 52 civil conflicts in our study generating 254 civil war year observations in which more than one rebel group was present.

In these cases, our solution was to merge the minimum value on variables like *'clear central command'*, *'strength of central command'* and the maximum values for variables like *'size of rebel armed forces'* across all of the groups operating in each conflict-year. Our logic in doing this is that a particular conflict environment is only as secure as its least cohesive/centralized rebel organization. That is, it is reasonable to suppose that one “bad apple” (highly decentralized rebel group prone to opportunistic defection) could ruin the environment for everyone because, even if the other rebel groups are highly cohesive – with highly centralized command and control – aid workers must still confront the risk of opportunistic defection posed by the least cohesive group in that environment. One could certainly argue that, empirically, this measurement choice may bias the independent variable values in favor of our theory, but in the analyses that follow, we run robustness checks using other measurement choices for the independent variables (i.e. the max, median, and mean values of each independent variable across the rebel groups battling the government in that conflict-year) to show that this is not the case, and we also subset the analysis on just the conflicts in which a single rebel group was present to ensure that the coding choice is not driving the results.

As a result of data limitations, the analyses that follow are generally conducted over approximately 320 conflict year observations for which we have a reasonable approximation of the rebel group characteristics in that conflict environment. Across these 320 conflict years, roughly 500 attacks resulting in over 1000 victims were coded in just 112 observations,

suggesting that attacks against aid workers are relatively concentrated within our study population.

### 3.2 Analysis

To test Hypotheses 1 and 2, we estimate the following models using the data described above:

#### Baseline Models Hypothesis 1:

$$Pr(\text{AidWorker Attack}_{it}) = \alpha_{it} + \beta_1 \text{centralcommand}_{it} + \beta_X \mathbf{X}_{it} + \mu_{it}$$

$$\text{TotalAidWorkerAttacks}_{it} = \alpha_{it} + \beta_1 \text{centralcommand}_{it} + \beta_X \mathbf{X}_{it} + \mu_{it}$$

#### Baseline Model Hypothesis 2:

$$Pr(\text{AidWorker Attack}_{it}) = \alpha_{it} + \beta_1 \text{rebelpoliticalwing}_{it} + \beta_X \mathbf{X}_{it} + \mu_{it}$$

In all cases, the parameter  $\text{AidWorkerAttack}_{it}$  is a dichotomous variable that captures whether *any* attack against an aid worker occurred in a civil war,  $i$ , in year,  $t$ .  $\beta_1$  is the parameter of interest for the key independent variables for each hypothesis,  $\mathbf{B}_X$  is the vector of covariate parameters for covariates  $\mathbf{X}_{it}$ , and  $\mu_{it}$  is the error term. In testing Hypothesis 1, we also estimate the relationship between our explanatory variables and the variable  $\text{TotalAidWorkerAttacks}_{it}$ , which is a continuous measure of the total number of aid worker attacks in civil war,  $i$ , in year,  $t$ , for reasons discussed in the results section below.

### 3.3 Control Variables

In each of the analyses below, we use a combination of control variables to account for the fact that our independent variables may not be randomly ‘assigned’ across different conflict environments. That is, rebel groups may establish stronger central command or maintain a political wing in civil conflicts where the underlying risk of an aid worker attack is greater for reasons not directly related to the collective action problems faced by rebel groups. To limit the risk of selection bias, we considered factors that may increase the overall likelihood of an ‘incidental’ aid worker attack. **Table 1** reports the correlation coefficients for the full list of candidate-variables we considered. We ultimately selected variables that were *significantly* correlated with the occurrence of an aid worker attack at the 0.10-level or greater as controls.

**[Insert Table 1 about here]**

We included a measure for the total number of *Battle Deaths* reported in a civil war as an approximate measure for the intensity of violence in that civil war year. The variable is used to approximate the number of bullets flying through the air and thus the likelihood that an aid worker might be randomly “caught in the crossfire”. Estimates for the total number of soldiers and civilians killed in each conflict year were taken from the PRIO Battle Deaths Dataset 3.0 (Lacina & Gleditsch, 2005).

Next, we included a measure for the *Total Humanitarian Assistance* disbursed in a civil war. We use the variable as a proxy-measure for the total number of aid workers in a

particular conflict environment, with the logic that an incidental attack is almost certainly more likely when aid workers are present in greater numbers. Estimates of the amount of humanitarian assistance provided in a conflict-year are taken from the OECD DAC data on official humanitarian aid disbursements.

Additionally, we included a measure for the *Size of the Largest Rebel Group* in a civil war year. Our logic in including this variable was that the likelihood of an incidental attack should increase in the opportunity for an aid worker–rebel interaction. Data on the size of rebel groups are taken from the Expanded Uppsala Armed Conflict Data on non-state actors described above (Cunningham, Skrede Gleditsch & Salehyan, 2009).

We also included a measure for the *Total Number of Groups* operating in a civil war-year based on the same logic that the number of aid worker attacks should increase in the opportunity for an aid worker–rebel group interaction. However, we also include the variable because we expect the likelihood of violence against non-combatants to increase in the level of contestation in that environment (see Humphreys & Weinstein, 2006; Keen, 2005). The total number of rebel groups operating in a civil war year was calculated by summing the total number of unique conflict dyads in each civil war based on the Expanded Uppsala Armed Conflict Data cited above.

Finally, in some of the analyses below, we include *regional* controls to account for the possibility that rebels might have different tendencies to establish strong central command and maintain political wings across different regions of the globe. If this is the case, any relationship between our main independent variables and the likelihood of an aid worker attack (which, as we demonstrated in the introduction, varies significantly by region), could be spurious due to reasons not observed in the data.

## 4. Results and Discussion

**Table 2** reports the regression results for Hypothesis 1. We display the results for six different models, each of which estimates the relationship between aid worker attacks and increasing central control – as measured by the degree to which a rebel group in the civil war exercises effective control over the territory in which it operates – in the population of all 457 civil war years in the period from 1997-2009.

**[Inset Table 2 about here]**

For Models 1-3, we estimate the likelihood of observing *any* aid worker attack at all using a dichotomous dependant variable coded 1 when the number of aid worker attacks is greater than or equal to 1 and 0 otherwise. Model 1 reports the result of a logistic regression with the most basic model specification, including only our main independent variable and the total number of *battle deaths*, total *level of humanitarian aid*, and *size of the largest rebel group* as controls. Model 2 reports the results of logistic regression using the same basic model but including the total *number of rebel groups* in that civil war year as an additional control. And finally, Model 3 reports results of the same logistic regression as Model 2 but includes regional dummies.

Models 4-6 estimate the relationship between the logged-number of total aid worker attacks and our explanatory variables using ordinary least squares regression. As before, we report the results for the most basic model specification on the left in Model 4, and then include additional controls for the number of rebel groups in Model 5, and regional controls

in Model 6. Again, the only difference between Models 1-3 and Models 4-6 is that the former estimate the likelihood of observing any aid worker attack while the latter estimate the relationship between the logged-number of total aid worker attacks and our main independent variables.

We estimated the relationship between our explanatory variables and two separate measurements of the dependant variable because the same factors that predict whether or not rebels will opportunistically attack an aid caravan may not necessarily predict the absolute number of attacks that occur. This is because whether rebels attack more than once will depend on many other factors that could be unrelated to the decision to hijack aid in the first instance. For example, a weak central command may present the opportunity for individual combatants to attack aid convoys, but whether or not rebels orchestrate subsequent attacks depends on how large or small the amount of diverted aid was. In cases where the amount of aid hijacked was large, it is reasonable to think that the same factors that successfully predicted the first attack (i.e low levels of central command) might incorrectly predict a third and fourth attack as rebels no longer have the incentive (demand) to attack aid workers again for more resources.

Nevertheless, the results in Table 2 demonstrate that both the likelihood and total number of aid worker attacks across conflicts is negatively correlated with the degree of effective territorial control exercised by a rebel group in that civil war. This result is consistent with our theoretical expectation that the greater the degree to which a central command exercises control over participants in a rebellion, the better able participants are to monitor and sanction opportunistic defections among individual members and solve the collective action problem that contributes to attacks against aid workers. Across almost all



specifications, the relationship between increasing strength of central command and the occurrence of aid worker attacks is negative and significant at the 5-percent level<sup>xii</sup>. The lone exception is Model 5, which estimates the relationship between the degree of control and the logged-number of aid worker attacks including the total number of rebel groups as a control.<sup>xiii</sup>

While not included in the tables here, we also tested to see if the results above were robust to the inclusion of the other control variables listed in Table 1. In all cases, increasing the effective territorial control of a rebel group is negatively associated with the occurrence of an aid worker attack. We also found the results held when using conflict fixed-effects. Finally, in cases where more than one rebel group operated in a particular conflict environment, we confirmed that the results were robust to using the minimum, maximum, mean, and median values of the independent variables.

**Figure 4** plots the substantive effect of moving from the lowest degree of effective territorial control exercised by a rebel group (on the left) to the highest degree of territorial control (on the right) holding all other covariates at their mean. Over the full range, the estimated likelihood of an aid worker attack decreases roughly 66-percent when moving from the lowest level of control to the highest level of control. This effect is consistently significant, as shown by the gray lines indicating the upper and lower bounds of the 95-percent confidence intervals.

**[Figure 4 about here]**

Before proceeding to Hypothesis 2, it is worthwhile to discuss the results on the control variables. Similar to previous work, we found that the likelihood and total number of aid worker attacks is uncorrelated with the overall intensity of violence. This result may be surprising to some, but it is consistent with the idea that attacks are not random. Occurrences of aid worker attacks also appear to be generally uncorrelated with the size of rebel groups and the total number of rebel groups involved in a contest. Interestingly, the one variable that is most significantly and robustly correlated with attacks against aid workers is the total amount of humanitarian aid disbursed in a particular conflict. This empirical relationship may not be entirely surprising, but the exact reason for the result is not immediately obvious: larger amounts of aid could be associated with more attacks because it means more aid workers are randomly caught in the cross-fire or because larger amounts of aid represent a larger prize and thus a greater incentive for combatants to defect from exhibiting restraint.

**Table 3** reports the regression results for Hypothesis 2. We display the results of five different models, each of which estimates the relationship between the likelihood of an aid worker attack and the presence of a rebel group that operates a political wing in each civil war year.

**[Inset Table 3 about here]**

Models 1-3 estimate the likelihood of observing any aid worker attack at all in the full population of 457 civil years from 1997-2009, this time substituting whether a rebel group

operates a political wing as our main independent variable. As in the previous table, we report the results for the most basic model specification on the left with Model 1, and then include additional controls for the number of rebel groups in Model 2, and regional controls in Model 3. Models 4 and 5 estimate the relationship in two separate subsamples of the full population. Model 4 estimates the relationship between our explanatory variables and the probability of an attack in non-democracies and Model 5 estimates the relationship in democracies.

The results of Models 1-3 show that the likelihood of an aid worker attack is negatively correlated with whether a rebel group operates a political wing in that civil war. This result is consistent with our theoretical expectation that rebel groups with a political wing will have the added incentive to police defections in order to avoid the political costs of alienating the local population. Across all three specifications, the relationship is negative and statistically significant at the 5-percent level. As one might expect, the results of Model 4 estimated in the subsample of non-democracies undergoing civil war shows no relationship between a rebel political wing and the likelihood of an attack against an aid worker, while the results of Model 5, estimated in the subsample of democracies undergoing civil war, shows a negative and strongly insignificant relationship between a rebel political wing and the likelihood of an attack. This result makes sense if one assumes that failing to exercise restraint and alienating the local population is much more costly in democracies where citizens can more easily punish rebels by withdrawing support. As before the results for hypothesis 2 should be interpreted with caution due to the small sample size from missing data.

## 5. Conclusion

Across the different conflict environments, rebel organizations face a similar challenge with respect to their relationship to humanitarian assistance: while foreign aid provisions represent an attractive source of easily lovable resources that could be used to sustain a war effort, the diversion of these resources away from the local civilian population can undermine a rebel organization's base of support when aid workers suspend their relief effort completely. And yet, despite the collective incentive to exhibit restraint, different rebel groups display marked variation in their behavior towards aid workers providing assistance. The occurrence and variation in attacks against aid workers thus present an interesting theoretical and empirical puzzle.

In this paper we outlined a view of rebel organizations as solutions to the collective action problems that individual combatants face. We focused specifically on collective dilemmas that arise with respect to rebels' relationship to humanitarian aid provisions, and we suggested that rebels face competing individual- and group-level incentives. While attacking aid workers to divert humanitarian resources may be a rational way to maximize personal gains in the short-term, if enough combatants defect from exercising restraint with respect to aid, rebels are likely undermine their collective goal of challenging the state. Based on this logic, we argued that that the likelihood of abuse will depend on at least two important factors related to groups' willingness and ability to solve this collective dilemma: first, whether sufficient collective incentives exist for armed groups to exercise restraint in anticipation of future punishments (or rewards), and second, whether factions exhibit strong centralized control that enables them to set in place disciplinary structures to identify and sanction opportunistic defections among individual members.

We tested two observable implications of this logic empirically using data on the organizational characteristics of rebel groups and found strong support for the theory. First, we found that members of more organized rebel groups which exercise a stronger degree of territorial control are much less likely to opportunistically attack aid workers when compared to combatants in less organized groups that lack the same ability to monitor and enforce restraint among individual members. Second, we found that rebel groups that operate a political wing are much more motivated to exercise restraint when compared to groups that lack the same collective incentives to avoid the political costs associated with the withdrawal of aid.

We believe that this paper makes an important contribution to our understanding of political violence because it suggests another way in which the organizational structure of groups could affect their willingness and ability to use violence (see also Berman 2009). Most models of rebellion assume too much internal unity of rebel groups. Indeed, most of the recent political science literature on civil conflict in the last decade formally models rebels as unitary actors who collectively bargain for maximal concessions from the government. While this assumption has certainly proved useful in generating implications about the onset and duration of war, it helps very little in explaining the conduct of war. Rather, the behavior of rebels within a conflict can best be explained by examining individual incentives to perform acts of violence.

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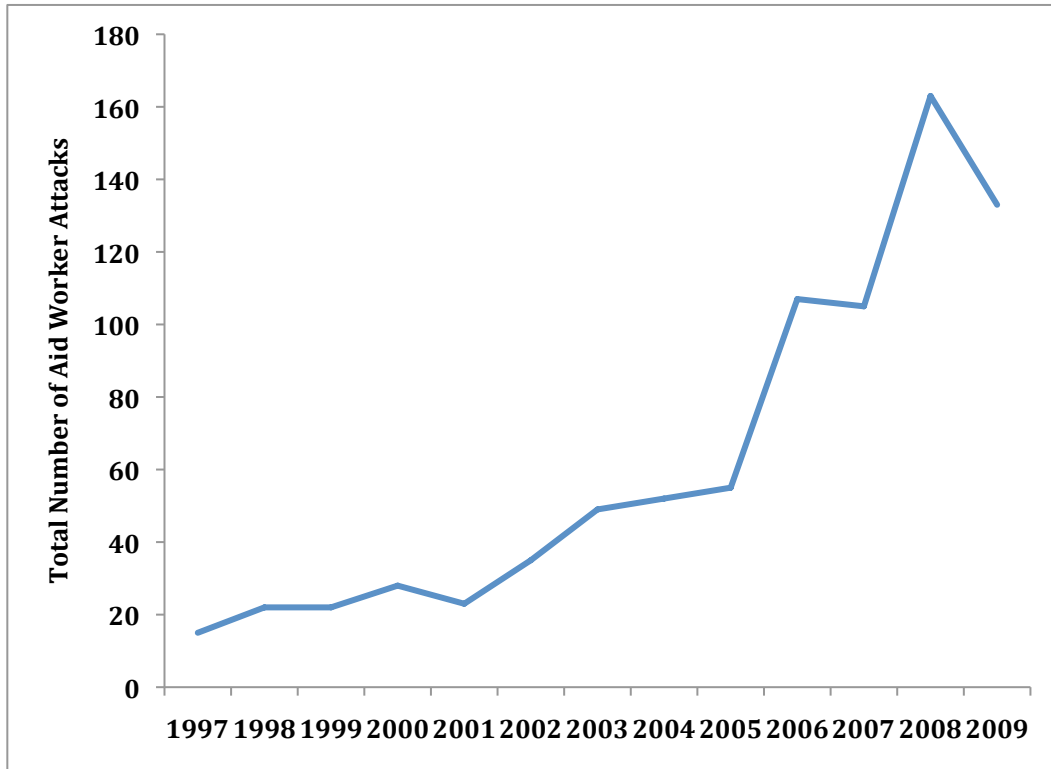
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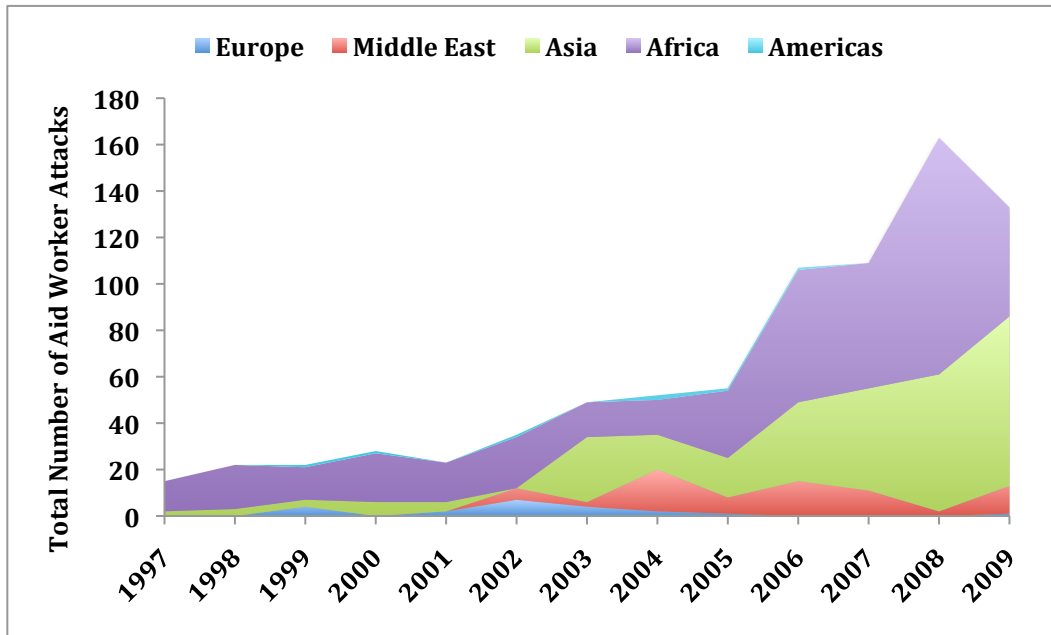
## **Figures and Tables**



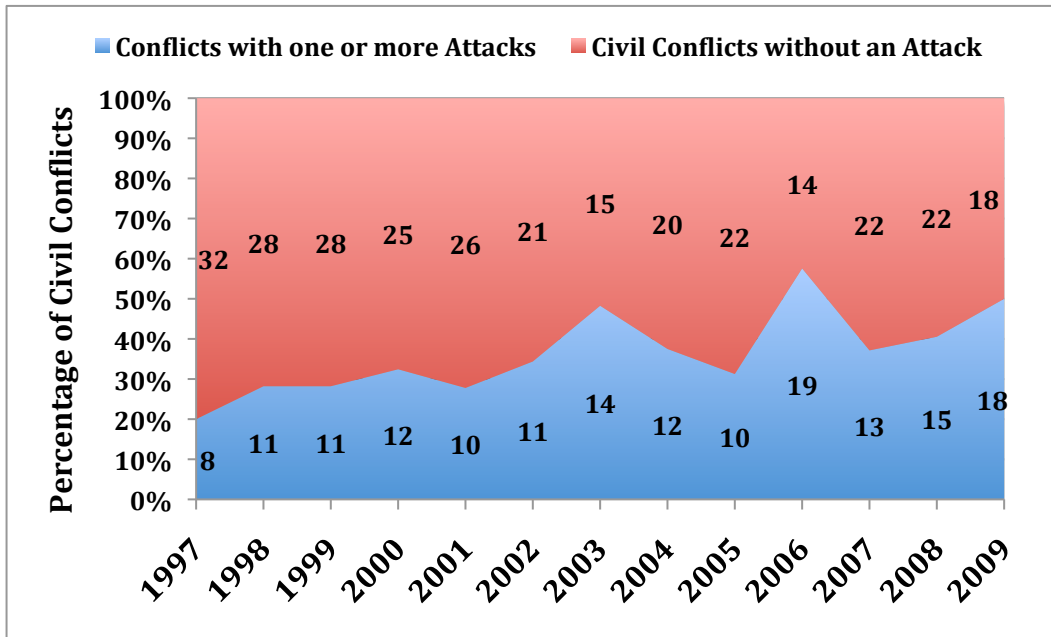
**Figure I: Total Number of Aid Worker Attacks over Time, 1997-2009**



**Figure 2: Total Attacks Against Aid Workers over Time stacked by Region, 1997-2009**



**Figure 3: Percentage and Number of Civil Wars in which an Aid Worker Attack Occurred over Time, 1997-2009**



**Table 1: Correlation Coefficients**

	Aid Worker Attack	Control Territory	Rebel Political Wing	Number of Groups	Rebel Group Size	Battle Deaths	Level of Aid Provisions	Lootable Resources	Mountainous Terrain
Aid Worker Attack	1								
Control Territory	-0.3150*	1							
Rebel Political Wing	-0.1738*	0.3213*	1						
Number of Groups	0.2452*	-0.6693*	-0.1721*	1					
Rebel Group Size	0.2779*	-0.2263*	-0.0739	0.2963*	1				
Battle Deaths	0.2041*	-0.1738*	-0.1555*	0.3751*	0.3864*	1			
Level of Aid Provisions	0.3280*	0.0125	0.0066	-0.0237	0.1464*	0.1354*	1		
Lootable Resources	0.1075*	-0.1716*	0.0331	0.1226*	-0.0057	0.1859*	0.049	1	
Mountainous Terrain	-0.0933	0.5843*	0.3535*	-0.2216*	0.2812*	-0.079	-0.0046	-0.2221*	1

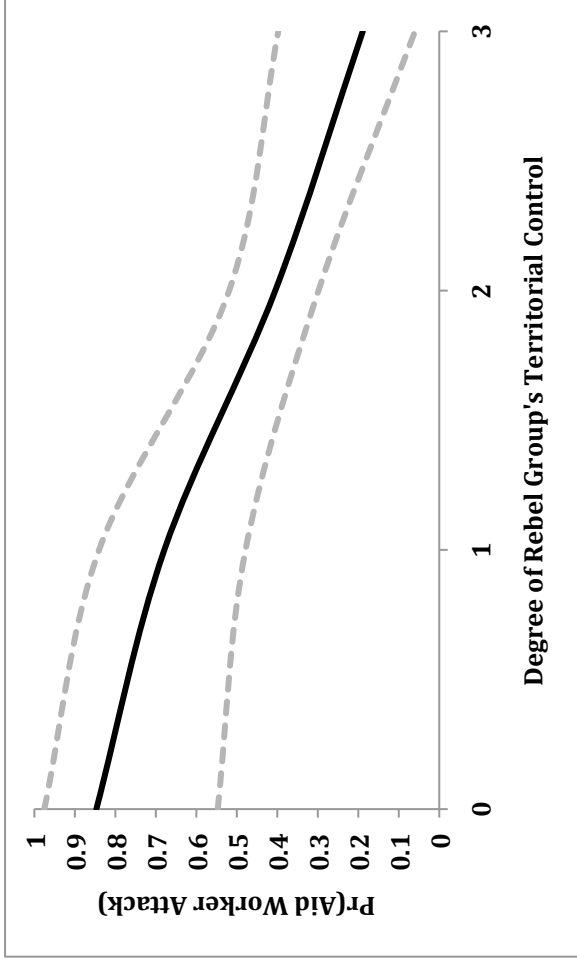
Note: The table presents correlation coefficients among country average values of the main variables used in the article.  
\*Correlation significant at 5%.

**Table 2: Degree of Rebel Territorial Control and the Probability of an Aid Worker Attack (Models 1-3) and the Number of Aid Worker Attacks (Models 4-6), 1997-2009**

VARIABLES	(1) Logit Pr(Attack)	(2) Logit Pr(Attack)	(3) Logit Pr(Attack)	(4) OLS Total Attacks	(5) OLS Total Attacks	(6) OLS Total Attacks
Degree of Rebel Territorial Control	-1.202*** (0.462)	-1.154** (0.587)	-1.502* (0.869)	-0.129** (0.0508)	-0.0680 (0.0670)	-0.189** (0.0747)
Battle Deaths	7.95e-05* (4.79e-05)	7.94e-05 (4.84e-05)	6.45e-05 (4.63e-05)	7.04e-06** (3.44e-06)	5.09e-06 (3.71e-06)	8.07e-06* (4.29e-06)
Total Humanitarian Aid	0.00317*** (0.00122)	0.00315*** (0.00122)	0.00441*** (0.00145)	0.000817*** (0.000150)	0.000814*** (0.000149)	0.00110*** (0.000152)
Size of Largest Rebel Group	3.26e-05* (1.86e-05)	3.11e-05 (2.14e-05)	2.40e-05 (1.62e-05)	4.49e-07 (1.27e-06)	1.01e-07 (1.29e-06)	-1.33e-06 (1.25e-06)
Number of Groups		0.0230 (0.177)	-0.0284 (0.241)		0.0254 (0.0183)	0.0288 (0.0233)
Middle East			-0.930 (1.772)			-0.202 (0.194)
Asia			-1.763** (0.813)			-0.219** (0.0989)
Africa			-2.078** (1.026)			-0.527*** (0.119)
Americas			-0.630 (0.988)			-0.265** (0.125)
Constant	0.881 (0.945)	0.771 (1.273)	2.991 (1.867)	0.355*** (0.105)	0.200 (0.153)	0.673*** (0.172)
Observations	320	320	320	320	320	320
R-squared				0.246	0.257	0.379

Standard errors in parentheses  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Figure 4: Substantive Effect of Territorial Control on the Probability of an Aid Worker Attack**



**Figure 4:** Substantive effect of moving from the lowest degree of effective territorial control exercised by a rebel group on the left to the highest degree of territorial control on the right holding all other covariates at their mean. Over this range, the estimated likelihood of an aid worker attack decreases roughly 66-percent when moving from the lowest level of control to the highest level of control. Gray lines indicate the upper and lower bounds of the 95-percent confidence interval

**Table 3: Rebel Political Wing and Probability of an Attack Against Aid Workers (1997-2009)**

VARIABLES	(1) Logistic pr(attack)	(2) Logistic pr(attack)	(3) Logistic pr(attack)	(4) Logistic pr(attack) Non Democracy	(5) Logistic pr(attack) Democracy
<i>Political Wing</i>	-0.782*** (0.281)	-0.634** (0.293)	-0.644** (0.319)	0.683 (0.730)	-0.721** (0.361)
Battle Deaths	5.76e-05* (3.33e-05)	5.93e-05 (3.76e-05)	6.86e-06 (3.70e-05)	0.000408 (0.000281)	5.01e-05 (3.40e-05)
Total Humanitarian Aid	0.00519*** (0.00132)	0.00544*** (0.00136)	0.00540*** (0.00141)	0.00714 (0.00534)	0.00471*** (0.00139)
Size of Largest Rebel Group	4.66e-05*** (1.39e-05)	3.98e-05*** (1.52e-05)	4.65e-05*** (1.61e-05)	2.92e-05 (6.11e-05)	2.15e-05 (1.42e-05)
Number of Groups		0.226** (0.109)	0.303** (0.126)	0.706* (0.384)	0.0733 (0.137)
Middle East			-2.850*** (1.038)		
Asia			-2.218*** (0.723)		
Africa			-1.145 (0.734)		
Americas			-1.015 (0.869)		
Constant	-1.426*** (0.231)	-1.935*** (0.317)	-0.350 (0.693)	-4.785*** (1.122)	-1.080*** (0.352)
Observations	320	320	320	320	320

Standard errors in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

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### Footnotes

<sup>i</sup> At the Gereida camp of 130,000 displaced people, aid workers were forced to retreat completely after armed men raided an aid compound, raped two women and stole several cars, satellite phones and computers

<sup>ii</sup> The Aid Worker Security Database. Available online at <http://www.aidworkersecurity.org>

<sup>iii</sup> Other well-known examples of this include the MSF withdrawal from Rwandan refugee camps in Tanzania in response to aid diversions (Terry 2004) and Sudan's Darfur region following the kidnapping and subsequent release of MSF volunteers in 2009.

<sup>iv</sup> Narang and Stanton (2013) show that much of the violence directed against humanitarian aid organizations is not random, but a strategic response aimed at controlling the civilian population. Specifically, they show that armed groups often target aid workers as a means of pushing aid organizations out of particular regions (or out of the country entirely), in an effort to undermine support for the government; to retain control over the provision of services to the population; and to preserve their authority over the civilian population.

Using newly compiled panel data on attacks against aid workers in Afghanistan across all 34 provinces from 2008 - 2012, they demonstrate that the intensity of attacks increases with the level of political support for the incumbent Karzai government. Indeed, the data suggests that the estimated average number of attacks per month increases roughly 75 percent when moving from the lowest percentile of Karzai vote share to the highest percentile of Karzai vote share.

<sup>v</sup> Indeed, a richer story would also include many other characteristics of the actual aid provisions themselves (i.e. the type, amount, and organizational provider of aid, as well as the level of security provided to the aid caravans

<sup>vi</sup> Statistically, so long as the factors that follow from an organizational theory of attacking aid workers are even somewhat orthogonal to the factors that follow from a strategic logic of attacking aid workers, then the two sets of factors can be estimated independently with little risk of selection bias.

<sup>vii</sup> A simple explanation of this logic applied to actors in political competition can be found in (Bates, 1988; Cox & McCubbins, 1993; Taylor, 1976)



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<sup>viii</sup> We limit our analysis to only this time period because it is the range for which we have data on the reported incidence of aid worker attacks from the Aid Worker Security Database.

<sup>ix</sup> Cited from coding notes online at: <http://www.aidworkersecurity.org/about-the-data.php>

<sup>x</sup> Included are NGOs, the International Movement of the Red Cross/Red Crescent, donor agencies and the UN agencies belonging to the Inter-Agency Standing Committee on Humanitarian Affairs (FAO, OCHA, UNDP, UNFPA, UNHCR, UNICEF, WFP and WHO) plus IOM and UNRWA.

<sup>xi</sup> Downloaded on December 06, 2010 at <http://www.aidworkersecurity.org/search.php>

<sup>xii</sup> These results should be interpreted with caution due to the small sample size from missing data.

<sup>xiii</sup> We do not have a good explanation for why the degree of control is not significant in Model 5