# Come Hell or High Water: Natural Disaster as a Catalyst for State Repression[1]

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**Abstract**

Natural disasters often cause significant human suffering. They may also provide incentives for states to escalate repression against their citizens. We argue that repression occurs in the wake of natural disasters due to multiple interrelated factors. First, disasters can increase grievances and exacerbate existing tensions between the state and society. Second, severe disasters strain the ability of the government to police opposition groups and exert effective control over populations in affected areas. The combination of increased grievances and declining state control creates windows of opportunity for challenges to state authority. As control weakens and instability increases, the state becomes increasingly likely to employ coercive violence to deter both actual and potential threats and to (re)assert control. The results of a cross-national analysis of annual state violations of physical integrity rights between 1976-2005 provide support for our central argument, as do additional tests of the casual processes specified in our argument.

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## Introduction

Natural disasters often produce large and unexpected costs to vulnerable states. Severe disasters may also exacerbate relations between the state and society and influence domestic political processes. By both reshaping state authority and introducing new actors and resources into the domestic political environment, disasters may also influence the dynamics of dissent and repression within an affected state. Typhoon Haiyan provides potentially valuable insight into this relationship. Haiyan struck the central Philippines in early November 2013, killing upwards of 5,000 persons and leaving as many as two million persons homeless. As with other severe natural disasters and in addition to the immediate human costs, the typhoon destroyed key infrastructure over an area totaling hundreds of square miles, paralyzed economic interactions over a significant portion of the country, and has forced the state to divert substantial resources into recovery efforts that would normally have been devoted elsewhere. It has also threatened to erode state capacity and undermine the regime's ability to maintain authority over disaster-affected areas. In Tacloban, for example, fewer that 10% of the city's police reported for duty in the week following the disaster.[2] Looting and violence were subsequently reported in several locations.[3] Even more concerning, members of the New People's Army (NPA) ambushed a relief convoy, suggesting the possibility of renewed organized violence.[4] These events suggest that severe natural disasters have the potential to significantly shape social and political interactions within an affected state, potentially leading to political unrest and violence.

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[2] de Leone, Sunshine and Barbara Demik, "Desperation Grows among Philippine Survivors of Typhoon Haiyan." *Los Angeles Times*, 12 November 2013. http://www.latimes.com/world/la-fg-philippines-typhoon-20131113,0,5789248,full.story#axzz2l6SgAxPo

[3] Chen, Te-Ping, "Typhoon Haiyan Was Followed by Another Storm—Looting." *Wall Street Journal* 24 November 2013. http://online.wsj.com/news/articles/SB10001424052702304281004579217712568440706

[4] Gutierrez, Jason. "Philippine Aid Convoy Ambushed as Troops Quell Looting." *Yahoo News*. 12 November 2013. http://news.yahoo.com/philippine-aid-convoy-ambushed-troops-quell-looting-094247420.html

While severe, Tyhoon Haiyan is not uncharacteristic of the devastation caused by natural disasters. Between 2002 and 2011 natural disasters were responsible for an average of 10,000 deaths annually and produced an average of $143 billion in economic damages. In 2012 alone some form of natural disaster impacted 125 million persons (Guha-Sapir, Hoyois, and Below, 2012). Scholars have recently recognized the potential influence of severe disasters on domestic political processes. Recent research has, for example, suggested a link between rapid onset disasters such earthquakes, volcanic eruptions, hurricanes, and floods to political and social conflict, including the outbreak of large-scale rebellion. This research, however, has generally ignored the manner in which natural disasters—and particularly state responses to them—affect more fundamental social and political interactions within the state. This oversight is problematic in that research linking disasters and civil war often overlooks the more fundamental processes of dissent and repression that can emerge from natural disasters. Large-scale civil conflict—the focus of most previous analyses—is a relatively rare event. Disasters, by contrast, are comparatively common. Moreover, incumbents in all states make important decision about how to best manage uncertainty and potential threats to stability in the wake of unexpected shocks such as natural disasters. We therefore believe there is much to be learned from examining how disasters shape these more basic political and social dynamics.

In this manuscript we therefore examine the manner in which natural disasters potentially shape the dynamics of contention and coercive response between the regime and its (potential) challengers. We argue that repression occurs in the wake of natural disasters as a result of multiple interrelated factors. First, disasters often increase grievances and exacerbate existing tensions between the state and society. Second, severe disasters strain the ability of the government to police potential threats and exert effective control over populations in affected

areas. The combination of rising grievances and declining state control creates windows of opportunity for challenges to the state. As control weakens and instability increases, the state becomes increasingly likely to employ coercive violence.

Several historical cases motivate our argument and may provide insights into the post-Haiyan Philippines and other states impacted by natural disasters. Among the most recent is the 2004 Indian Ocean Tsunami, which caused some 240,000 deaths and displaced as many as two million people in a dozen countries, mostly is South and Southeast Asia. Sri Lanka was among the hardest hit, and where the disaster produced the most adverse impact on domestic politics (e.g., Beardlsey and McQuinn, 2009; Le Billon and Waizenegger, 2007).[5] In the wake of the disaster the Liberation Tigers of Tamil Eelam (LTTE) and the government of Sri Lanka competed to control the massive inflows of humanitarian aid. The government used aid as a political tool to weaken the position of Tamil rebels (Enia, 2008). Moreover, both sides attempted to take advantage of the perceived weakness of the other side and extend their control over territory. In short order, rising state repression provoked political assassination and terrorism that led to a return to large-scale violence by the end of the following year. We observer similar (though distinct) dynamics across a range of other cases, including the 1972 Nicaragua earthquake (6,000 deaths), the 1976 Guatemalan earthquake (23,000 deaths), the 1992 Cairo Earthquake (500 deaths), and, most recently, Hurricane Katrina (2,000 deaths) in 2005. We discuss many of these cases in more detail in this manuscript.

Our manuscript proceeds as follows. We first review relevant literature on the motives for state repression as well as recent literature on the relationship between disasters and political unrest and instability. We then turn to our argument, highlighting the manner in which disasters

[5] There some evidence that repression increased in Aceh in the immediate after of the Tsunami, though at a lower level. The government declared martial law, the military was accused of detaining and beating citizens, and there were some reports of attacks on aid workers (Human Rights Center, 2005).

often contribute to conditions that incentivize increasing state repression. We then discuss our research design and the results of our empirical analyses. The results of a cross-national analysis of annual state violations of physical integrity rights between 1976-2005 provide support for our central argument. We also present a series of auxiliary analysis that provide additional evidence of the causal processes we identify in our argument. Finally, we discuss the implications of the findings and offer suggestions for future research.

**Motives for Repression**

We begin with a brief overview of the motives for regime repression. As we articulate in greater detail below, natural disasters create conditions that previous research suggests should increase the regime's incentives to repress the population, particularly in those areas most affected by the disaster. From a decision theoretic perspective, an incumbent's decision to repress is a function of the perceived ratio of its strength to that of potential challengers (Poe and Tate 1994; Poe 2004). Where the incumbent's perception of its strength is increasing relative to challengers its reliance on abuse should decline and it should rely on alternative methods to ensure its survival. By contrast, as the perceived strength of threats increases, the incumbent is expected to increasingly resort to repression. It is important to note that state repression varies significantly across states as a function of largely static factors such as regime type and development level (Davenport and Armstrong, 2004; Bueno de Mesquita et. al., 2005; Davenport, 2007; Poe and Tate, 1994). Yet, repression is typically fairly stable from one year to the next, suggesting that it assumes a state of punctuated equilibrium[6] in which some (largely unanticipated) shock leads to

[6] The concept of punctuated equilibrium (Elderedge and Gould, 1972) has recently been applied to public policy making (Baumgarter and Jones 1993) and interstate rivalry (Diehl and Goertz 2000). In its most basic form, the punctuated equilibrium approach argues that the dynamics of a certain phenomena (e.g., natural selection and rival hostility levels) are generally stable and can change rapidly in response to certain types of shocks.

changes in regime behavior. Consequently, the central question is less *whether* repression occurs, but rather what factors drive *changes* in repression from one time point to another.

Other recent research highlights the impact of both endogenous events and exogenous shocks on state repressive behavior. Most notably, overt challenges to the economic, social, or political status quo often provoke increased repression. Incumbent regimes often respond to behavioral challenges such as protests and strikes by increasing their reliance on coercive strategies such as mass arrests, torture, disappearances, and killings of dissident activists (e.g., Davenport, 1995; Moore, 2000; Rasler, 1996). Consistent with the strength/threat ratio discussed above, rising dissent is expected to trigger increasing repression. This relationship deepens in the face of violent challenges. Repression reaches it acme during rebellions and insurrections, particularly in cases where government control is seriously eroded or when challengers enjoy broad popular support (e.g., Kalyvas, 2006; Valentino, Huth and Balch-Lindsay, 2004). Taken together, the literature strongly suggests that repression increases when regime authority is challenged or when incumbents are unable to exert control over their territory and their citizens.

Other recent studies extend this core idea to examine the manner in which other types of "shocks" provoke spikes in repression. Unanticipated changes in the social or political status quo threaten regime stability by adversely impacting the incumbent's ability to maintain the support of coalition members or by increasing the relative power (e.g. threat) of opposition groups. For instance, the imposition of economic sanctions contributes to increased repression in the target state both by eroding regime control, emboldening political opposition, and constraining the ability of the incumbent to provide the resources necessary to prevent defections from the winning coalition (Wood, 2008; see also Peksen, 2009). In a related manner, rapid demographic changes can increase regime threat perception and provoke repression. For instance, the rapid

expansion of young people within a society, who are typically more risk acceptant and prone to radicalization than average, contributes to instability by producing an aggrieved and easily mobilized mass of persons, which in turn contributes to rising repression (Nordas and Davenport, 2013) or large-scale political violence such as civil war (e.g. Urdal 2006). We contend that natural disasters may present similar threats. Principally, costly rapid-onset disasters disturb the political status quo, exacerbate pre-existing state-society tensions, and potentially threaten the stability of the regime. Each provides incentives for the regime to increase repression.

**Disaster and Dissent**

Natural disasters provide both motives and opportunities for disaffected groups to challenge regime authority. This occurs for two reasons. First, it provides a focal point for grievances and mobilization against the regime. Second, state policing capacity and sanctioning ability declines following rapid-onset disasters. The combination of rising grievances and reduced government control over disaster-afflicted areas is expected to create opportunities for mobilization against the regime. Where focused grievances and a robust political opposition precede disaster events, this condition increases the likelihood of armed rebellion.

Existing literatures on disaster and conflict point to the manner in which disasters create conditions of scarcity and thus lead to competition (often violent competition) over increasingly scarce resources (Brancati, 2007; Nel and Righarts, 2008; see also Homer-Dixon, 2001). This research further emphasizes that natural disasters serve as a focal event around which a government's performance can translate to an evaluation of the legitimacy of the regime (Olson and Gawronksi, 2010; Pelling and Dill, 2010). Disasters shift public focus from how well a government provides for higher-order needs to how well it provides basic needs like food,

shelter, and human security. Developed states are not immune to becoming politically vulnerable during natural disasters, as the case of Hurricane Katrina in the United States illustrates. Furthermore, even in decentralized political systems, the focus for political attention can shift from local governments to the national government (Schneider, 2008). Overall, disasters are likely to lead to popular discontent with regime and exacerbate existing grievances and factionalism (Le Billon and Waizenegger, 2007). Tepid regime responses to disasters can undermine regime legitimacy, especially in emerging democracies, leading to increased support for regime removal and diminishing political tolerance (Carlin, Love, and Zachmeister, 2014). Disasters therefore have the potential to create a lens through which political actors examine pre-existing cleavages in how political goods and power are distributed in the state (Pelling and Dill, 2010). Disasters may highlight unequal distribution among groups, particularly where the disaster produces large-scale human suffering and state response is uneven, thereby providing motivations to challenge the status quo.

Most central to our argument, natural disasters also facilitate the opening of political windows of opportunity for the expression of grievance—both those generated by the disaster itself and those that precede the disaster. Previous research on contentious politics and social movements suggest that structural and political changes within a polity can promote popular mobilization. This occurs via a variety of overlapping mechanisms, including the emergence of new domestic of international allies and temporary reduction in the will or ability of the state's repressive capacity (e.g., Brockett, 1991; McAdam, 1996: 29-30). Both of these characteristics commonly occur in the wake of large-scale natural disasters. First, disasters inhibit regime control and sanctioning capacity, facilitating both non-violent and violent mobilization against

the state. Second, international actors and foreign NGOs responding to the disaster often create alliances with local communities, which can contribute to an increase in agency and activism.

Diminished capacity to police the population is central to the existing literature on the relationship between natural disasters and violent domestic conflict. Nel and Righarts (2008) apply elements of the opportunities framework and focus on the manner in which disasters stretch state capacity and create space for resistance to rule. Berrebi and Otswald (2011) employ a similar perspective in linking natural disasters to terrorism. Their argument suggests that terrorism increases in the wake of disasters in large part because the government in forced to divert resources toward disaster recovery and away from other areas such as security provision. Declining government control opens space through which extremists groups can launch assaults on the state and vulnerable citizens. Recent literature also provides some evidence that disasters induce non-violent political mobilization and participation (Nardulli, Peyton and Bajjalieh, 2013; Olson and Drury 1997; Drury and Olson 1998).[7] Challenges to state authority in the aftermath of large-scale disasters may also undermine regime stability and threaten incumbent survival (Flores-Quiroz and Smith, 2013).

Importantly, however, the manner in which the regime responds to the disaster significantly shapes both mobilization and the likelihood of regime survival. Where the ability to repress local activism declines or where citizens are allowed to or forced to congregate in confined areas—such as at aid stations or in temporary relief camps—the probability of anti-government activity increases (Flores-Quiroz and Smith, 2013). Refugee camps and aid stations often serve as centers of anti-government activities and important sources of recruits for violent

[7] Nardulli, Peyton and Bajjalieh (2013) find an overall increase in the rate of anti-government demonstrations and other civil unrest following disasters. However, they point out that the effect is quite variable and only 1 out of 6 disasters produce substantial increases in such challenges, suggesting the importance of intervening variables in explaining dissent. We note, however, that the overall relationship is largely consistent with previous findings.

opposition groups. Moreover, opposition groups or rebel factions often divert humanitarian aid to their own causes, increasing their capabilities and their ability to sustain violent or nonviolent challenges to the regime (Lischer, 2006; Salehyan, 2009). Thus disasters may create opportunities to challenge the state, and—at least in some cases—responses designed to ameliorate human suffering may accelerate opposition and strengthen anti-regime challengers.

By contrast, where the regime provides a robust and rapid response that limits the number of persons in such facilities and the time they must spend there, or where it can effectively deny citizens access to such sites, the likelihood of such challenges declines. The Burmese junta adopted the latter strategy in the wake of Cyclone Nargis in 2008 in an attempt to reduce the likelihood of protests and other challenges (Flores-Quiroz and Smith, 2013). Consequently, regime response often dictates subsequent protest behaviors, and repression is one strategy by which regimes attempt to (re)assert authority in the wake of disasters. The decision to repress, however, is a function of the extent to which disasters create opportunities for challenges to the state. Where these threats emerge or where governments fear their emergence, repression is likely to increase. In the subsequent section we expand on these relationships.

**Repressing Post-disaster Threat**

Drawing on the literature discussed above, we argue that severe natural disasters often provoke observable (though temporary) increases in state repression. In brief, the relationship between natural disasters and repression is based largely on the manner in which disasters provide unexpected opportunities for both violent and nonviolent challenges to state authority. The emergence of new threats (or the perception of such threats) in turn drives the state to (temporarily) increase repression as a deterrence strategy.

While several studies suggest a relationship between disasters and political instability and violence, most existing studies ignore the importance of government response strategies in shaping protest and rebellion. This oversight is problematic given that the interaction of dissent and coercive regime response largely determines whether a conflict escalates or whether challenges are effectively deterred. Olson and Drury (1998), for example, suggest that repression can effectively quash outbreaks of anti-regime activity in the wake of disasters. Nardulli, Peyton, and Bajjalieh (2013: 20-21), however, find that while state repression may increase dissent in the wake of disasters, high levels of state repression may effectively suppress organized political violence against the state. These works highlight the importance of regime strategies in response to disasters in shaping subsequent conflict events. Yet, as previous studies suggest, challenges to the regime often prompt coercive responses. As such, understanding the dynamics of contention in the wake of disasters necessitates exploring the impact of immediate-onset disasters on state decision regarding repression.

If previous studies are correct that disasters and create opportunities for both violent and nonviolent challenges to the state, then they are also likely to create incentives for coercive responses by the state. Moreover, as state control diminishes, the incentive for employing coercive violence against real and perceived threats is likely to increase. It is important to note that the capacity to effectively police the population and suppress dissent is not necessarily the same as the regime's ability to engage in coercive repression against perceived threats. Indeed, as Arendt observes (1970: 56), violence often emerges where power is threatened. As legitimate authority and state control collapses, repressive violence increasingly becomes the default strategy adopted by the state. Severe disasters hinder the regime's ability to communicate and coordinate policing and security efforts (Le Billon and Waizenegger, 2007). As such, the regime

is increasingly unable to effectively monitor potential threats and to preemptively intervene to prevent them from growing into more robust challenges. As the severity of a disaster increases (both in terms of costs and geographic range), the policing and monitoring capabilities of the state can be quickly spread thin. Previous research suggests that this is central to the onset of organized dissent and anti-regime violence. As is the case during insurgencies, incumbent violence is more restrained where they exert effective control over territory and effectively police the population; by contrast, as control erodes, violence is anticipated to become increasingly indiscriminate (e.g., Kalyvas, 2006). Put simply, declining control creates strong incentives for repression, particularly where new actors challenge regime authority.

As the ability to monitor opposition declines, incumbents increasingly rely on more repressive responses in an attempt to maintain authority and deter emerging threats. Such threats might include violent opposition, non-violent dissent, or the emergence of other actors that supplant (or attempt to supplant) state authority. For instance, the Marmara earthquake in Turkey in 1999 killed upwards of 20,000 people and eroded the regime's ability to exert effective control over the area. Moreover, the government's disaster response was initially slow, which provided an opportunity for civil society organizations to fill the relief void, thereby usurping authority normally reserved by the state. In this context, the delivery of aid and provision of services to citizens impacted by the disaster became highly politicized as it highlighted state weakness and elevated the status of civil society organizations. The ascendance these actors in turn created a political crisis for the state. Public criticism of the state's response led to increasing state hostility toward civil society groups, and the government began to target specific groups for repression and in some cases seized their assets (Pelling and Dill, 2010).

The October 1992 Cairo earthquake also illustrates this dynamic, though in more dramatic manner. The earthquke led to the deaths of over 500 people, injured 10,000, and rendered more than 40,000 persons homeless. As was the case in Turkey, the Egyptian government was initially slow to react to the disaster while civil society organizations—including the Muslim Brotherhood and others Islamist groups—responded immediately. According to one observer, "the government was totally paralyzed. [President Hosni] Mubarak was traveling abroad, and for two days the regime did absolutely *nothing*, nothing at all. Within hours, though, the Islamists were on the streets—with tents, with blankets, with food, with alternative housing" (emphasis in original) (Berman, 2003: 260-261). Arguably, the response was an effort by the Islamists to establish its own legitimacy while delegitimizing the regime—a strategy that appeared successful as popular support for these groups increased in the wake of the disaster (Berman, 2003; Kepel, 2006: 277; 293-294). The Egyptian government responded by cracking down on non-governmental groups providing aid. The regime invoked military decrees allowing it to freeze any funding from outside the country from coming into help NGOs in relief efforts Singerman (2002). Throughout the remaining months of 1992 and through the following year, the Mubarak regime intensified repression of civil society groups, particularly Islamist organizations. In December the police initiated an intensive search-and-arrest campaign in Imbama, one of the areas hardest hit by the earthquake and stronghold of Islamist groups. The weeks-long campaign resulted in the detention of more than 700 people by the end of the year. Within the first two months of 1993 security forces detained an additional three hundred supporters of Islamist groups.[8] Consistent with the argument presented above, the disaster

[8] *Amnesty International Report 1994—Egypt*. http://www.refworld.org/docid/3ae6a9f128.html and *Human Rights Watch World Report 1994—Egypt*. http://www.hrw.org/reports/1994/WR94/Middle-02.htm#P137_70431

increased grievances with in the affected area and created opportunities for rival actors to supplant state authority. Facing theses threats, the regime responded by escalating repression.

As these examples suggest, repression is likely to increase in the wake of disasters. Specifically, we argue repression becomes more likely when leaders face the threatening combination of increased popular dissent and reduced policing and sanctioning capacity in the wake of natural disasters. By providing both a focal point for opposition and reducing government authority and policing capacity in affected areas, natural disasters lead to an overall weakening of state control. Declining control in turn increases the incentives for incumbents to increase repression against real or perceived threats. This produces our central testable hypothesis:

**Hypothesis 1:** *State-sponsored repression increases in the wake of natural disasters.*

In line with our theoretical logic, if our primary hypothesis is true, we should also see related phenomena occurring. Disasters are likely to aggravate grievances, accelerate existing political dynamics (Le Billion and Waizenegger, 2007; Lindell and Prater, 2003) and open windows of opportunity for challenges to the state. The emergence of these challenges (or the state's fear of their emergence) ultimately leads the state to increase its reliance on repression. Furthermore, if disasters lead to increased grievances against the state and provide a window of opportunity for opposition to form and act, then we would likely also observe increased dissent, in either non-violent or violent forms. Thus we suggest two auxiliary hypotheses to test our causal mechanism.

**Auxiliary Hypothesis 1**: *Non-violent dissent increases in the wake of natural disasters*.

**Auxiliary Hypothesis 2**: *Violent dissent increases in the wake of natural disasters*.

**Data**

Our hypotheses predict that state-sponsored repression increases in response to the severity of natural disasters. Since we predict states are likely to increase the use of physical repression, we rely on the Political Terror Scale (PTS) (Wood and Gibney, 2010) as our primary dependent variable. This indicator explicitly measures state-sponsored violations of physical integrity rights such as extrajudicial executions, disappearances, torture and beatings, and political imprisonment within a state's borders, which we expect are most likely to escalate in the wake of natural disasters as the state attempts to reassert control and deter challenges to its authority. PTS scores are based on information obtained from annual human rights reports published by Amnesty International and the United States Department of State.[9] The resulting index is a five-point ordinal measure of physical integrity violations within a country in a given year. Countries receiving a score of "1" are under the secure rule of law and rarely engage in observable acts of abuse against citizens (e.g., Canada or Finland most years) while countries scoring a "5" engage in widespread, systematic abuses of these (e.g., Syria in recent years).

Data on natural disasters are taken from the CRED EM-DAT International Disaster Database (CRED, 2012). Not all types of disasters are relevant to our analysis. Our argument focuses on the manner in which severe, unanticipated, rapidly occurring disasters impact state repression. It does not address the influence of disasters related to climatic changes such as droughts, which are typically slower to emerge and provide greater time for governments to respond and the population to adapt. We therefore specifically limit our analysis to rapid onset

[9] All models report results for the Amnesty International-based PTS scores. Results using scores based on United States Department of State annual country reports are very similar. We also conducted analyses using the aggregate CIRI Physical Integrity Rights Index (Cingranelli and Richards, 1999). Results are both substantively and statistically similar and are available in our online appendix.

disasters, including floods, tropical storms, hurricanes, cyclones, and volcanic eruptions.[10] For inclusion in this dataset, a disaster must meet one of the following criteria: ten or more persons reported killed, one hundred or more persons reported injured, the declaration of a state of emergency, or a call for international assistance.

Even with these inclusion criteria, disasters within the dataset vary tremendously in terms of intensity and the severity of the damage they inflict. Moreover, we argue that the combination of declining state control over storm-affected areas and rising popular grievances present potential threats to the state, thereby contributing to an increase in repression. This necessitates a variable that captures variation in the severity of disasters rather than simply its occurrence. We gauge disaster severity by the number of deaths caused by the above-mentioned rapid-onset disasters occurring within a state in a given year. In our analyses we rely on the natural log of the annual count of deaths resulting from natural disasters. This transformation allows us to control for the influence of states with extremely large populations as well as for the likelihood that disasters severity has a non-linear influence on repression.[11] Finally, while the risk of dissent and political violence may peak immediately following disasters (Narduli, Peyton, and Bajjalieh, 2013), it is also possible that dissent-repression dynamics evolve over a longer temporal window. We therefore include both the current values and one-year lags of these measures in separate analyses.[12] Figure 1 illustrates the annual average number of disaster-related deaths for states within the sample as well as the annual mean PTS score. While inferring any particular

[10] This includes related events resulting from the initial disaster such land and mudslides, storm surge, and flooding.
[11] In alternative specifications we substitute a population-scaled disaster variable (deaths per 1000 persons). The results are statistically weaker but generally quite similar to those presented here. We also substituted the logged value of the number of persons rendered homeless by the disaster. These results were also very similar.
[12] The temporal lag also helps us account for the fact that the most intense months of Atlantic and Pacific hurricanes seasons as well as Pacific typhoon seasons fall in the latter half of the calendar year.

relationship between the variables based on this figure is unwise, it is nonetheless interesting to note that the values do appear to covary over time, at least to a degree.

**Figure 1 Here**

Previous studies identify a set of robust control variables for use in the analysis (e.g., Poe and Tate, 1994; Davenport, 1995; Davenport and Armstrong, 2004). Given the strength of the expected relationship between challenges to the regime and repressive responses, we control for both the number of anti-regime protests and domestic terror attacks within the state during the year. Data on anti-government protests comes from Banks (2005) while data on domestic terror events comes from the Global Terror Database.[13] Each is expected to increase the likelihood of state repression. We also include measures of a state's per capita gross domestic product and population size (Gleditsch, 2002). Previous studies also demonstrate that state institutions influence state repression. While greater levels of democracy generally reduce repression, the relationship is not strictly linear (Davenport and Armstrong, 2004). We therefore include dummy variables for democracy and "anocracy". As is common practice, we code a state as a democracy if it attained a score of 6 or higher on the Polity2 measure of the Polity IV dataset (Marshall, Jaggers and Gurr, 2011) and as an "anocracy" if it received a score between -5 and 5.

We also control for humanitarian aid. Disasters do not occur in a vacuum, and the international community often responds rapidly by committing substantial assistance to affected states. While this variable is not commonly included in statistical analyses of repression, we believe its exclusion would possibly bias our results. This aid arguably exerts a significant influence on both the affected population and the government of recipient state. Many of the

[13] We rely on replication data from Piazza (2011) for these data. A binary civil conflict variable produces similar results to those presented here.

examples that we cite suggest that inflows of foreign disaster assistance promoted political instability by emboldening civil society actors, delegitimizing the state, or deepening competition between the state and (potential) challengers. If this is true, we might expect larger aid disbursements to positively correlate with increased repression. However, it is also possible that if aid is employed effectively it might dampen animosities toward the state, hasten reconstruction, and promote state authority and control in affected areas. We therefore make no direct predictions regarding the influence of such assistance, but acknowledge its potentially influential role and therefore include it as a control. Our assistance variable represents the value of humanitarian aid flowing into a state in a given year scaled to the size of the recipient state economy. Unfortunately, available sources do no specifically differentiate disaster aid from other types of humanitarian assistance. Our variable therefore includes aid flows to cases in which no disasters occurred. However, as we discuss below, we attempt to isolate the influence of disaster-related aid in subset analyses. Humanitarian assistance data are taken from the recently compiled Aid Data (2.0) dataset (Tierney et al., 2011).

**Model and Results**

We test our hypotheses by evaluating the relationship between the severity of disasters and changes in state repression in a sample of 148 countries for the years 1976 to 2005. Because the dependent variables in the analyses are ordinal measures of state abuse of physical integrity violations, we rely on ordered probit models to evaluate this relationship. In all models standard errors are clustered on the country to account for within unit correlation. Finally, because we are employing panel data, we must consider the effects of temporal dependence within panels. In

order to account for this, we employ a series of binary lags of our dependent variable, where each dummy represents a category of the dependent variable (excluding a reference category).

**Table 1 Here**

Table 1 reports the results from the ordered probit models. According to the results presented in Model 1, an increase in disaster-related deaths is positively and significantly related to increasing state repression. Model 2 repeats the analysis but uses a one-year lag of the deaths variable. The results are quite similar, again showing that increasing disaster deaths correlate with rising regime repression. This suggests that not only does the risk of repression increase immediately after disasters it also remains relatively high over the next year. Model 3 adds humanitarian assistance as a control variable. Interestingly, these results suggest that such aid is positively (but not significantly) related to increased repression. As with the previous models, the disaster deaths variable is both positive and statistically significant.

Some states rarely experience large-scale disasters while others experience them frequently. Models 4 and 5 therefore restrict the sample to only cases that experienced a rapid onset natural disaster in the current or previous year respectively. Restricting the sample in this ways allows us to isolate the influence of disaster severity (as opposed to presence of disasters) on regime repression. In addition, this constraint helps us to distinguish disaster-related aid from other types of humanitarian assistance. As noted above, we are unable to easily separate disaster-specific assistance from other types of humanitarian aid. We might reasonably assume, however, that much of the humanitarian assistance flowing into a country immediately following a disaster is related. As with the previous models evaluating the full sample, increases in disaster-related deaths correlate with an increased likelihood of repression in both the year of the disaster and

following year. Interestingly, while humanitarian assistance appeared to have little influence on state repression in the models evaluating the full sample, we find a positive and significant relationship when examining the constrained sample. While we do not directly theorize about the impact of aid, it is interesting to note that in the context of disasters humanitarian assistance may contribute to increased repression. Additional research should more directly investigate this possible relationship.

**Figure 2 Here**

The results in Table 1 provide evidence of the relationship specified in our central hypothesis: state repression is expected to increase as the severity of natural disasters increases.[14] In order to facilitate substantive interpretation of these results, we computed marginal effects for the relationship identified in Models 3 and 4. These predictions are presented in Figure 2. In the figure the *X*-axis depicts the number of disaster-related (the natural log of deaths) accrued during the previous year while the *Y*-axis is the estimated probability that the state received a score of "4" on the PTS index given that it had received a score of "3" during the previous year. Put otherwise, the figures show the predicted probability that state repression increased by one category from the previous year as a function of the severity of disasters during the previous year. For instance, all else equal, the base probability of a one-unit increase in repression from the previous year to the current it approximately 7% when there were no disaster-related deaths in the previous year. However, a 500 deaths disaster (6 on the logged scale) raises the probability of a one-unit increase in repression to 11%. While the absolute change appears small, this

[14] All models report results for the Amnesty International-based PTS scores. Results using scores based on United States Department of State annual country reports are very similar. We also conducted analyses using the aggregate CIRI Physical Integrity Rights Index (Cingranelli and Richards, 1999). Results are both substantively and statistically similar and are available in our online appendix.

suggests that the relative risk of an increase in repression rises by a factor of approximately 1.5. Furthermore, a disaster-related death count of 25,000 (~10 on the logged scale) increases the risk of a one-unit increase in in the dependent variable to approximately 13%, roughly doubling the initial risk of an observable increase in repression. As the bottom panel of the figure demonstrates, the predicted increase in regime repression is similar in the constrained sample. The likelihood of unit increase in repression doubles over the range of the deaths variable.

A number of cases within our sample fit the argument we outlined as well as the predictions presented above. For instance, we previously discussed the events surrounding the 1992 Cairo Earthquake, which killed 500 persons. Consistent with our argument and results, we observe a one-unit increase in Egypt's PTS score between 1992 and 1993. This increase in repression was arguably driven primarily by the emergence of al-Gama'a al-Islamiyya during the year. However, the sequence of events is consistent with our argument. The rise of civil society groups as a challenge to state authority promoted a crackdown on the activities of popular civil society groups, including the Muslim Brotherhood and other Islamist organizations that had taken the lead on the provision of aid. This crackdown (and the slow government response) increased population dissatisfaction with the regime and contributed to growing support for opposition groups. Some of these groups radicalized and launched a campaign of terror against the state and its interests, which led to further increases in state terror over the course of the year.

A similar pattern of emerges in Sri Lanka following the deaths of 30,000 persons in the 2004 Indian Ocean Tsunami. As with the Egyptian case, we note that repression increased by one category in the PTS in the year following the disaster. The tsunami struck Sri Lanka during a period of relative calm in the conflict that began with the 2002 ceasefire agreement between the Tamil Tigers and the Sri Lankan government. While the disaster initially produced some

goodwill between the former belligerents, hostilities spiked less than a year after the disaster. Responsibility for the spike in violence lies with both sides as each attempted to exploit a perceived weakening of the other's capabilities by resuming attacks and attempting to exert unilateral control over aid resources deployed within their areas of control (Beardsley and McQuinn, 2009; Le Billon and Waizenegger, 2007: 418). For its part, the LTTE used the opportunity to shore up its control over Tamils in disaster-affected areas, expropriated or rejected aid from the international community, and increased recruitment among the local population, including the forced recruitment of child soldiers. Fearing that the LTTE might turn the combination of increased instability and inflows of external aid to their advantage, the government of Sri Lanka increased repression of civil society groups and NGOs and restricted political activities. In short order, political assassinations increased—including the assassination of the Foreign Minister by the LTEE on August 12, 2005—and abuses by security forces climbed rapidly over the year.[15]

Finally, we observe similar relationships in the wake of the 1976 Guatemalan Earthquake, which killed more than 25,000 persons. While repression in Guatemala predated the disaster, several studies suggest that the earthquake represented a critical juncture in Guatemala politics and shaped the dynamics of both the state violence indigenous conflict that defined the country for the subsequent two decades (Gawronski and Olson, 2013; Manz, 1994: 191; Sanford, 2003: 126). According to these studies, the earthquake (as well as the international aid that followed) provoked a wave of community organizing and popular mobilization that had not existed before the disaster. Recognizing that the government was uninterested in responding to their post-disaster needs, affected (largely indigenous) communities formed their own

[15] See for example the 2005 entry for Sri Lanka in the United States Department of State *Country Reports on Human Rights*: http://www.state.gov/j/drl/rls/hrrpt/2005/61711.htm

reconstruction committees throughout the state. These local organizations dealt directly with the international NGOs community, which called increasing attention to the crisis and lead to increased political activism among the population. During the year following the earthquake, social movement activity increased precipitously throughout the country (Gawronski and Olson, 2013: 140). Growing political mobilization and dissent was viewed as a security threat to the incumbent regime, which responded by increasing repression of the indigenous population. Consequently, the period following the earthquake corresponds to the steady increase in state violence, which by 1978 reached the level of mass killing. As with other cases, this uptick in repression is reflected in the data used in our analysis—Guatemala's PTS score increased in the year following the earthquake.

As each case illustrates, repression often follows in the wake of disaster. As we stressed above, however, disasters are not often in and of themselves responsible for regime repression. While the results presented above establish a statistically significant correlation between the severity of immediate onset natural disasters and state repression, they do not necessarily allow us to evaluate the steps in the processes that drive the relationship. Evaluating the extent to which disasters increase the likelihood or frequency of challenges to the regime would therefore provide additional evidence for our causal story. We therefore conduct a series of additional analyses to evaluate these mechanisms. Specifically, we model both anti-regime protest (nonviolent dissent) and domestic terror attacks (violent dissent) as functions of the severity of natural disasters and common covariates.

Abbreviated results are presented in Table 2. Models 6 and 7 presents the results for the influence of disaster deaths on anti-regime protest while Models 8 and 9 presents the results for the terror equation. Because both outcome variables represent counts that exhibit significant

overdispersion, we employ negative binomial regression. As in the repression models presented above, we cluster standard errors by country to control for within unit correlation. We rely on the same protest and terrorism data used in the analyses presented above and include standard control variables.[16] The results provide additional evidence for the causal pathways discussed above. According to the results in Models 6 and 7, increases in the logged value of disaster-related deaths in both the current and the previous year are positively related to increases anti-regime protest. That being said, the result is only marginally significant in the model using the lagged deaths value. The results in Models 8 and 9 suggest a similar relationship between disaster-related deaths and terror attacks. The variable reflecting the current deaths value is positively signed and statistically significant. As with the dissent models, the lagged deaths variable is positively signed but only marginally significant. Together this suggests that the strength of these relationships declines as time passes since the disaster. To the extent they occur in the wake of disasters, challenges to the state are likely to emerge rapidly. Overall, however, these results are consistent previous studies that suggest disasters create opportunities for challenges to the regime. Most importantly, the results provide support for the causal mechanisms we discussed above. Rapid onset serves as a catalyst for repression by creating opportunities for both violent and nonviolent challenges to the state.

**Table 2 Here**

**Figure 3 Here**

[16] In the *terrorism* models we control for humanitarian assistance, economic development, population size, political competition and executive constraints, inequality, economic growth, and the presence of terror attacks in the previous year. In the *dissent* models we control for humanitarian assistance, economic development, population size, population density, democracy, anocracy, inequality, economic growth, state repression, and presence of anti-regime dissent in the previous year. Full results from these models are included in the online appendix.

As with the repression models, we also compute the marginal effects for the dissent and terrorism equations in order to gauge the substantive impact of these relationships. We present these in Figure 3. The upper panel of the figure represents the predicted influence of the logged disaster-related death count on anti-regime dissent activities, while the lower panel shows the expected impact of this variable on terror attacks. Based on the predictions in the upper panel, the expected number of protests is expected to increase by a factor of three over the range of the disaster severity measure. This suggests a modest influence of disasters on protests, but one that is largely consistent with previous findings. Furthermore the predictions also suggest that disaster-related deaths influence terror attacks against the state. The frequency of terror attacks more than doubles over the range of the disaster-related deaths measure. While other factors likely influence the probability that disasters lead to large-scale dissent, these results provide additional (if preliminary) support for our causal story. Regime repression increases in the wake of natural disasters because of the manner in which the disaster creates opportunities for challenges to the state.

**Conclusion**

In addition to generating significant economic and human costs, rapid onset natural disasters may contribute to political instability and both violent and nonviolent social and political conflict within affected states. While much of the recent literature within this emerging research agenda focuses on potential connections between disasters and civil conflict or war, we believe prior research often has overlooked the way disasters shape more fundamental political processes within states. Among these are patterns of dissent and repression. While few states experience large-scale civil conflicts, dissent and coercive state responses are observed in all states, even if

their intensity differs greatly across cases and over time. Addressing this oversight is therefore critical given the role that state coercion plays in influencing the manner in which dissent unfolds, potentially culminating in large-scale civil conflict.

This manuscript explores the relationship between natural disasters and contentious politics. Specifically, we argue that disasters often lead to observable upticks in state repression. We believe this relationship emerges as a result of two interrelated processes: an overall loss of bureaucratic and institutional control by the state and rising state-society tensions. The combination of these factors creates potential windows of opportunity for both violent and nonviolent challenges to state authority. Where such threats emerge, we expect incumbent regimes to increase violence in attempt to deter challenges and reestablish control. The results of our quantitative analyses provided support for the hypothesis that recent disasters contribute to spikes in regime repression. We further demonstrated the validity of the argument by providing evidence of the causal pathway through which disasters contribute to repression. Principally, our results suggest that disasters contribute to both violent (terrorist attacks) and nonviolent (anti-regime protests) challenges to the incumbent regime. Finally, we cite anecdotal evidence for theses sequences of events that match closely with the patterns found within our sample data. Taken together, we find significant support for our central argument.

This analysis demonstrates that disasters can create conditions conducive to increasing state repression. As such, it suggests that disasters may provide a signal for where increases in state repression may soon occur and thus where international attention should be devoted. This observation suggests that the international community should carefully monitor the post-disaster climate of the Philippines. While the government has thus far acted with significant restraint at the time of this writing, rising grievances among the affected population, declining security, and

increased social tensions may lead to dissent and coercive response within a relatively short window of time. A particularly intense response might be expected if extremist factions elsewhere in the state use the disaster as an opportunity to escalate their own attacks on the state and its citizens.

While our argument and findings suggest a relationship between disasters and repression, we recognize numerous additional avenues for exploring the impact of natural disasters on social and political conflict. Examining the conditioning influence of domestic political institutions represents one potentially fruitful avenue for future research. We suspect that the relationship may not be entirely intuitive. That is, democratic institutions may influence state responses to disasters, but it is not entirely clear that they would completely constrain state repression. For instance, following Hurricane Katrina in 2005, human rights groups reported numerous abuses in and around New Orleans, including imprisonment for minor infractions like curfew violations, often without formal charge or processing (Amnesty International, 2010; Metzger, 2006-2007). Security forces were also accused of firing on unarmed civilians—the shooting of six persons (and deaths of two) by New Orleans Police Department officers on Danziger Bridge represents the best documented of such incidents (Amnesty International 2010: 21). While this response is consistent with part of our argument—repression occurring as a function of lost monitoring and policing capacity—the disaster did not produce the kinds of organized competition and threat that we hypothesize produce state violence. While developed democracies may experience an immediate loss of bureaucratic control, and possibly increased repression, the political effects may be different from other types of states. Indeed, recent studies find that disasters may destabilize both democratic and nondemocratic states, though the mechanisms differ, and the former are more sensitive to particularly severe disasters (Quiroz-Flores and Smith, 2013).

Consequently, further investigation of the manner in which institutions condition state responses to disasters could improve our understanding of the human and social costs of natural disasters.

Our analyses also highlight the potentially important influence of post-disaster aid flows in shaping the likelihood of social and political conflict in the wake of natural disasters. While beyond the scope of our argument, the results presented above suggest that (at least under some conditions) disaster-related humanitarian aid may increase the likelihood state repression. This finding, while disappointing, is not necessarily surprising. Previous studies find that such aid can become a source of friction and political competition among rival social groups within the state as well as between the state and society (Beardsley and McQuinn 2009; Cohen and Werker, 2008). Other recent studies similarly find that inflows of humanitarian aid to unstable political environments may incentivize terrorism and attacks on civilians (Hoffman, 2004) or prolong existing civil conflicts (Nunn and Quian, 2013). Further investigation into the role of aid in potentially exacerbating or mitigating social and political tensions in post-disaster states therefore represents a theoretically interesting and substantively important area of future inquiry.

**Table 1: Ordered Probit Results (Repression)**

| | **Model 1** | **Model 2** | **Model 3** | **Model 4** | **Model 5** |
|---|---|---|---|---|---|
| | *Full sample* | *Full sample* | *Full sample* | *Disaster Sample* | *Disaster Sample* |
| **Deaths**[‡] | 0.028* | | 0.028* | 0.032* | |
| | (0.014) | | (0.014) | (0.016) | |
| **Deaths**$^{‡}_{(t\text{-}1)}$ | | 0.024* | | | 0.054* |
| | | (0.012) | | | (0.014) |
| **Humanitarian Aid** | | | 0.043 | 0.174* | 0.111[†] |
| | | | (0.021) | (0.052) | (0.066) |
| **Dissent** | 0.024* | 0.025* | 0.024* | 0.017 | 0.025* |
| | (0.010) | (0.010) | (0.010) | (0.012) | (0.011) |
| **GDPpc**$^{‡}_{(t\text{-}1)}$ | -0.172* | -0.172* | -0.166* | -0.184* | -0.186* |
| | (0.024) | (0.024) | (0.025) | (0.034) | (0.037) |
| **Population**$^{‡}_{(t\text{-}1)}$ | 0.044[†] | 0.048* | 0.048[†] | 0.047 | 0.033 |
| | (0.025) | (0.024) | (0.026) | (0.029) | (0.033) |
| **Domestic Conflict**[‡] | 0.195* | 0.193* | 0.195* | 0.189* | 0.179* |
| | (0.022) | (0.022) | (0.021) | (0.029) | (0.027) |
| **Democracy** | -0.540* | -0.535* | -0.548* | -0.474* | -0.406* |
| | (0.061) | (0.061) | (0.061) | (0.090) | (0.089) |
| **Anocracy** | -0.029 | -0.027 | -0.038 | -0.081 | -0.085 |
| | (0.048) | (0.048) | (0.047) | (0.071) | (0.072) |
| **Wald $X^2$** | 1444.06 | 1411.43 | 1404.15 | 1145.27 | 706.37 |
| **Observations** | 3,724 | 3,724 | 3,724 | 1,814 | 1,763 |

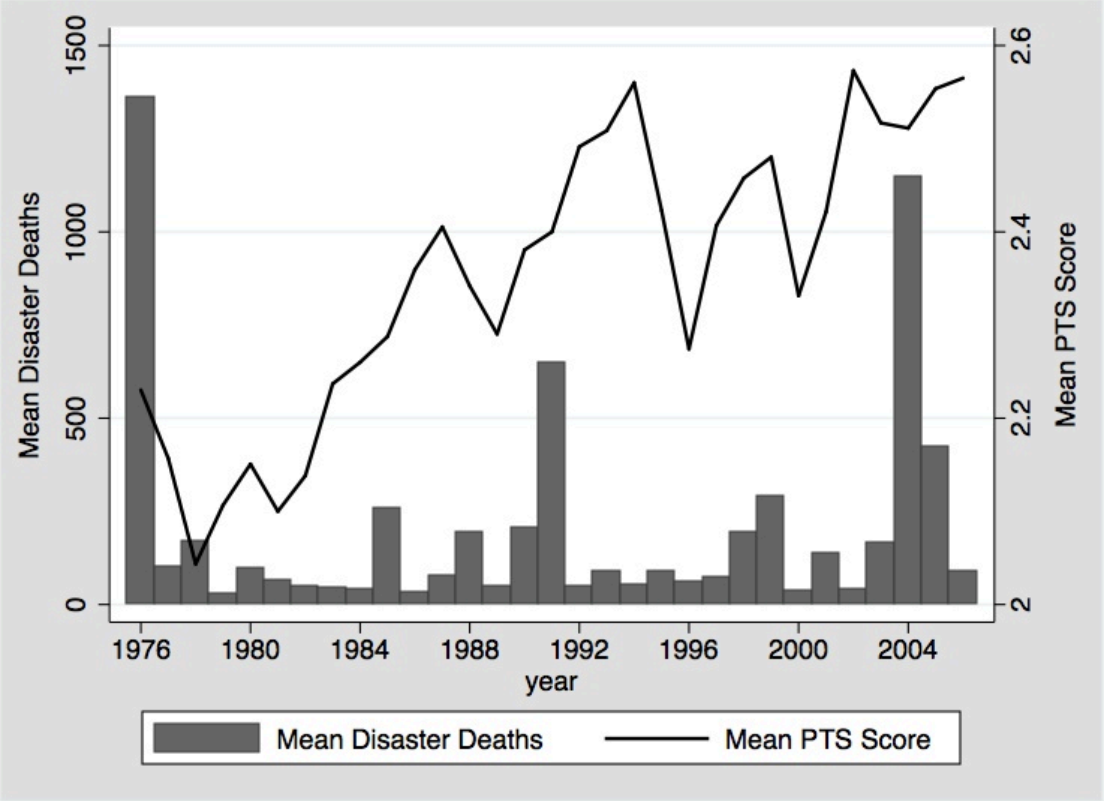
Coefficients and standard errors (clustered on country).
Constants as well as binary lags of the dependent variable suppressed for space.
Two-tailed significance tests. *$p$=< 0.05; [†]=$p \leq 0.1$.
[‡]=Natural log

**Table 2: Negative Binomial Results (Dissent and Terrorism)**

| | **Model 6** | **Model 7** | **Model 8** | **Model 9** |
|---|---|---|---|---|
| | *Dissent* | *Dissent* | *Terrorism* | *Terrorism* |
| **Deaths**‡ | 0.070* | | 0.063* | |
| | (0.033) | | (0.029) | |
| **Deaths**‡**$_{(t-1)}$** | | 0.042† | | 0.052† |
| | | (0.025) | | (0.029) |
| **Wald $X^2$** | 396.91 | 381.31 | 289.84 | 281.64 |
| **Observations** | 3,526 | 3,526 | 3,998 | 3,898 |

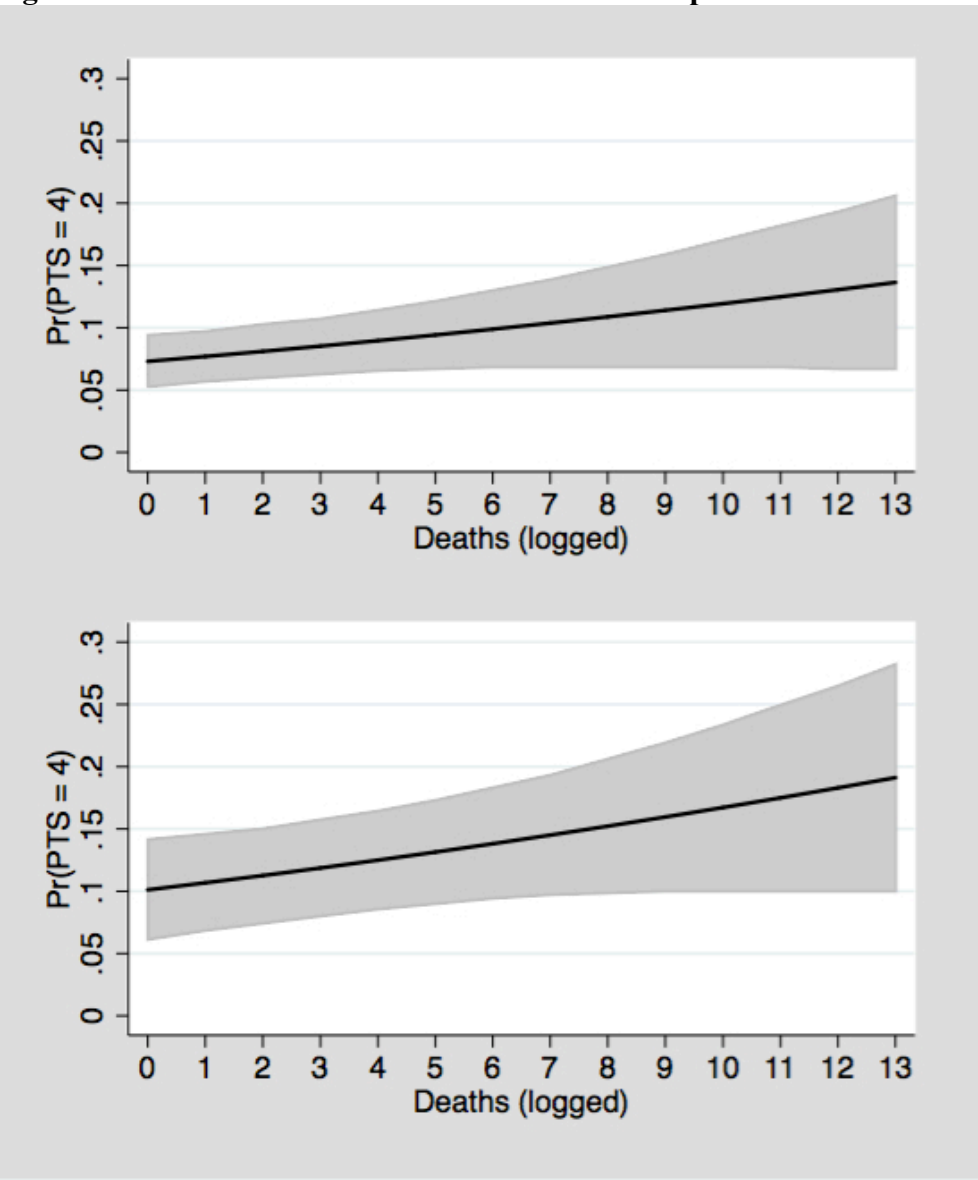
Coefficients and standard errors (clustered on country).
Control variables suppressed for space.
Two-tailed significance tests. *$p$=< 0.05; †=$p$ < 0.1.
‡=Natural log

**Figure 1. Annual Mean Disaster-related Deaths and PTS Scores**



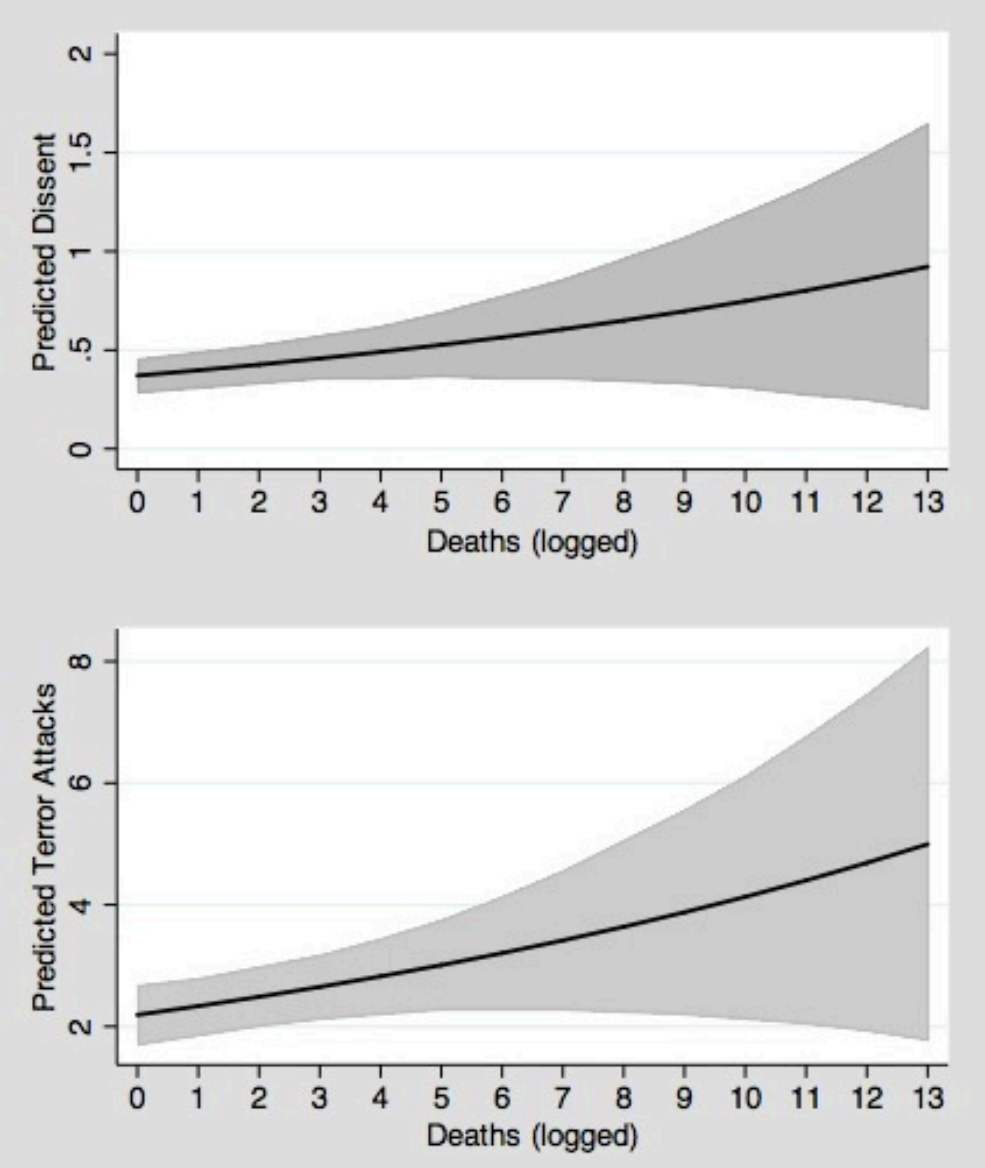

Annual mean levels of state repression and natural disaster related deaths.

**Figure 2. Predicted Effect of Disaster Deaths on Repression**




Marginal effects based on results presented in Models 3 and 4 of Table 1. X-axis represents disaster-related deaths accrued in the previous year. Y-axis reflects the probability that the state's PTS score increases to category "4" provided it received a score of "3" in the previous year (a one unit increase). 95% confidence intervals denoted by shaded area.

**Figure 3: Predicted Effect of Death Count on Dissent and Terror**




Marginal effects based on Models 6 and 8 of Table 3. Top panel demonstrates the predicted effect of changes in the logged death count (X-axis) on the expected number of anti-regime protests (Y-axis). Lower panel shows the predicted effect of changes in the logged death count (X-axis) on the expected number of terror attacks protests (Y-axis). 95% confidence intervals denoted by shaded area.

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