

## SOCIETY

by Daniel Aldrich

## More trust meant fewer deaths in Fukushima

# The need for 'social capital'

**Daniel Aldrich** is associate professor of political science at Purdue University. This is adapted with permission from his essay in *Social Science & Medicine* on "The physical and social determinants of mortality in the 3.11 tsunami." Aldrich presented a version of this paper at a conference in Berlin last November on the topic of social trust in Japan. The conference was sponsored by the German Association for Social Science Research. The notion of the conference is that trust is a form of "social capital" just as important to modern economies and societies as physical capital and "human capital," i.e. skill levels.

The tsunami that hit Japan's Tohoku region on March 11, 2011 killed more than 15,800 people, caused the disappearance of an additional 2,600, and forced the evacuation of some 400,000 residents. Yet, mortality rates varied tremendously across localities, many of which were not located directly on the coast.

The share of the population missing or deceased in the inundated areas averaged 1%. The maximum, 11%, occurred in the city of Onagawa, where more than 600 people perished. However, the vast majority of localities suffered no fatalities.

One might think that the number of deaths depended on the height of the tsunami when it hit a locality. That is true to some extent, but the linkage is much weaker than one might expect. Some cities with tsunami heights greater than 60 feet had low mortality rates. Some other cities with tsunami heights lower than 21 feet suffered disproportionately higher fatalities. This article addresses that puzzling finding by looking at the impact of social conditions. It turns out that, even more so than tsunami height, political support for the Liberal Democratic Party (LDP) and the strength of "bonding social capital" strongly influenced fatality rates. ["Bonding" social capital refers to the ties among a small group of people who have personal connections, e.g., a small community where a neighbor might go to the home of the elderly and help them evacuate; by contrast, "bridging" social capital refers to the sense of connection among much wider groups of people, most of whom are strangers, e.g., employees in a large firm or

citizens in a nation; and "linking" social capital refers to the ties between citizens and authorities—*TOE*.]

### Helping your neighbor

Unlike the Indian Ocean tsunami where the earthquake and the retreating ocean water were not uniformly interpreted as a sign of tsunami danger, Tohoku communities have been repeatedly exposed to tsunamis and/or tsunami-training in the past. Children regularly take part in school evacuation drills and a number of neighborhoods and towns practice community evacuation as well.

However, whether or not residents in Tohoku and elsewhere actually left a vulnerable area to flee to higher ground depended not primarily on this education, but rather on local norms and the behavior of one's family as well as the intensity of ties to a local social network. Successful risk avoidance involves not just accurately receiving messages about hazards sent out by the authorities. It requires that individuals take the initiative to pass along the information to neighbors who may not have heard them, as well as providing mutual support for evacuation.

Social networks in local communities can be seen as a form of informal insurance mechanism. Where communities share behavioral norms and have deep reservoirs of trust in each other and the authorities, they are more likely to act on group information about risks. Therefore, pre-disaster levels of bonding capital, i.e., the ties that bind residents to friends and neighbors, may matter because of their influence on information sharing, mutual help, and spontaneous col-

lective action.

Localities with close social ties and mutual trust were better able to evacuate the community's most vulnerable segment: the elderly and infirm. Fragmented communities with less trust and less ability to work collectively were not able to do so as well. As one study of the 1995 Chicago heat wave deaths argued, "Those at risk were isolated and lacked a concerned network of family and friends." In addition, "linking" social capital, i.e., the ability to connect quickly to decision makers and authorities to verify hazard warnings and to guide rescue efforts, may also have played a role in saving lives. "Linking" social capital ties strongly into political variables, as we explain below.

### The ties that bind save lives

In order to test the roles of social capital in tsunami survival, we employ proxies that capture "bonding" and "linking" social capital in Tohoku localities. We envision pre-tsunami crime rates as a proxy for bonding social capital based on extensive sociological research. Communities with fewer connections between individuals and lower expectations about future interactions will encounter higher rates of crime than areas where neighbors feel tied to both each other and their homes. In regions where people lack past connections or envision themselves as outsiders, they are less likely to abide by local behavioral norms or worry about long-term social consequences for deviance. Scholar Robert Putnam has argued that, "Higher levels of social capital, all else being equal, translate into lower levels of crime... This inverse relationship is astonishingly strong—as close to perfect as one might find between any two social phenomena."

Here's what we found in our research: holding all other factors constant, communities which had higher crime rates before the tsunami experienced greater levels of mortality during it. A municipality that had 15 crimes per 1,000 people tended to have a death rate 30 times higher than one where there were only one to two crimes per 1,000 people.

Communities which had been plagued by low trust and high crime before the disaster experienced higher rates of mortality because of an inability to self-organize and provide mutual help during a critical period. Research has shown how very similar communities with different levels of mobilization potential responded very differently to the

same disaster; this happened to the side-by-side neighborhoods of Mano and Mikura in Kobe, Japan. Following the 1995 earthquake, as fires broke out across the city, the community of Mano self-organized fire brigades to fight the conflagration, while Mikura did not. In the case of the 2011 tsunami, interviews that I conducted with survivors about their behavior and the behavior of family members who did not survive illuminated that many did not evacuate upon hearing the initial tsunami warnings. Those who evacuated described being heavily influenced by neighbors and friends who urged them to do so or came directly to their homes to ensure their safety. Communities with lower evacuation rates were clearly at greater risk of mortality. We would argue that deeper trust and more social cohesion made collective evacuation behavior more likely across the Tohoku area.

### Voting for the LDP made a difference

In contrast to purely social connections, some experts have emphasized that political factors, such as local support for the LDP, may affect mortality. This can be expected because stronger support for the LDP may increase subsidies to local governments; that money in turn may allow local government officials to increase the number of disaster preparation measures. According to this view, towns supportive of the LDP may have received greater public investments in reliable infrastructure for tsunami protection, such as sea walls; the LDP may reward strongly supportive towns, provide fewer benefits to towns which have supported opposition parties, and provide larger benefits to communities which could “swing” towards the LDP.

In testing this theory, here is what we found: communities where LDP support in 2009 was greater than 35% had lower death rates than those with weaker levels [keep in mind that, due to the many parties competing, the LDP could win with far less than a majority, and that the data looks at voting support in 2009, a year when the LDP lost the Diet by a large margin; so 35% is a high level of support in that year—*TOE*]. In communities with average levels of support for the LDP—between 25% and 30%—the death rates were almost as low as those with strong support.

Holding all other factors constant, mortality rates in communities weakly supporting the LDP tended to hover around 2%;

communities with average-level support for the LDP had a mortality rate averaging 0.7%; those communities which gave the LDP above-average support had mortality rates around 1%; and those that strongly supported the LDP had the lowest mortality rate at 0.04%. Strong LDP support translated into statistically significantly lower levels of mortality, as did average levels of support (the latter indicating a “swing” district). Tohoku communities weakly supporting the LDP—perhaps because of consequent lower levels of funding for infrastructure and investment in mitigation policies—fared worst of all.

### Policy implications

A tremendous amount of the budget (nearly \$200 billion) set aside for disaster mitigation before March 2011 and for post-disaster recovery has primarily gone into physical infrastructure, especially the construction of seawalls.

Yet our analysis found no support for the view that the pre-existing seawalls provided any protection against mortality. This may have been because the average height of the seawall was well below the average height of the tsunami. For example, in Kamaishi, the 1.2 mile-long seawall cost \$1.5 billion, but was nonetheless overrun by the tsunami; this expensive infrastructure had no measurable effect on casualties. The new investments may raise the seawalls to effective heights, but it also may be that the existence of a seawall creates a moral hazard as local community members may believe themselves safe because of its existence. If seawalls encourage residents to remain in place after an earthquake, they set up a dangerous precedent. As a side note, many fishing- and tourism-dependent communities oppose the creation of extended seawalls, fearing that these barriers may reduce the effectiveness of fishing efforts and cut down on the number of tourists interested in coming to the community. Given that ongoing recovery efforts in the Tohoku region show a great deal of money flowing into physical infrastructure projects set up through top-down planning, such spending should be rethought or at least publicly discussed with residents.

Next, research has shown that social capital, like financial and human capital, can be created through policy interventions. Japan’s reconstruction budget should be allocated toward community-friendly physical

and social infrastructure to reconstruct and strengthen ties among people. For example, the *machizukuri* (town strengthening) plan of each municipality—including access to public services such as government offices, hospitals, elderly and infant/child care centers, and schools—should be carefully decided by community-participatory decisions. In fact, randomized field experiments in South Africa and Nicaragua have demonstrated the possibility of increasing generalized and specific trust through various policies, including focus-group meetings. Several Tohoku communities, including Onagawa, are experimenting with community currency and time-banking programs which have been shown to have strong positive influences on local levels of “bonding capital.” Additionally, a number of non-governmental organizations (NGOs) are working to create shared spaces where residents of all ages can regularly interact and create lasting ties. Others are employing cooperative farming programs, which have seemingly improved both the social connections and physical health of participants.

Finally, many political critics have long argued that the LDP attracts rural voters through pork barrel spending, directed subsidies and often useless *hakamono* (empty box) or road-to-nowhere projects. Corruption scandals have regularly graced the front pages of newspapers and eroded trust in governing institutions. Even major changes to Japan’s electoral laws in 1994 have caused few large-scale changes in electoral politics.

Negotiations over participation in international institutions, such as the Trans-Pacific Partnership, intended to liberalize trade and reduce the protection of domestic interest groups, have instead resulted in additional redistribution to rural constituencies. Our findings underscore the continued role of “clientelistic” politics in rural Tohoku communities and suggest the need to ensure better and more equitable policies in the future.

As we move into the 21st century, we enter an era when the number of disasters and their physical costs are only increasing; global warming and urbanization amplify these trends of extreme weather events and greater vulnerability. While factors such as wave height and local demographics may be immutable, other critical ones, especially social cohesion, should be the target for policy programs at the local, regional, and national levels.