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**Timeline**

2008-2014

**Sample Size**

242 communities in three counties

**Research Implemented by IPA**

Yes

# Predicting Local Violence in Liberia

## Abstract

Many post-conflict countries suffer from high rates of crime, violence, and unrest. Early warning systems, if viable, would help police and peacekeepers anticipate violence before it happens. But is it possible to predict where violence will occur? In response to this question, researchers built a statistical model based on data IPA gathered over four years in the most conflict-prone areas of Liberia. The model correctly predicted 88 percent of violence two years into the future, albeit at the expense of many incorrect predictions that violence would occur. The study also found that of 56 potential risk factors, only a handful consistently predicted violence over time—especially ethnic diversity and polarization. The study should be replicated to determine whether these results generalize beyond these communities and time periods.

## Policy Issue

Weak and war-torn states are especially vulnerable to violence and political instability. Fragile governments typically fall short in delivering services to citizens, in controlling corruption, and in holding law-breakers accountable, and many punishments for wrong-doing occur outside the law.<sup>1</sup> In post-conflict settings, governments often focus their efforts and resources on communities that are perceived to be at high risk of violence based on their past history. In some settings this may be a sensible rule of thumb. However, is prior violence the best predictor of future violence? What risk factors, if any, predict future violence? Answering these questions could help in the development of early warning systems that

identify hot spots and anticipate violence before it occurs. Such systems could help police and peacekeepers allocate scarce resources to the places that need them most.

## Context of the Evaluation

In 2014, Liberia celebrated over a decade of peace after 14 years of civil war. Yet incidents of local violence continue to threaten life and property, and even apparently small-scale disputes easily spiral out of control. While violence has decreased steadily since 2008, the decline has slowed over the last two years, and the prevalence of violence remains moderate to high. Seventeen percent of the communities in this study suffered at least one destabilizing incident of violence in 2012.

## Details of the Intervention

Researchers tested the feasibility of an early warning system for predicting violence in Liberia using data collected in three waves (2008, 2010 and 2012) from 242 Liberian towns and villages in three conflict-prone counties: Lofa, Nimba and Grand Gedeh. The researchers, from Columbia University and Yale University, focused on the most destabilizing forms of local violence: 2 violent strikes and protests, violent clashes between ethnic groups, murders, rapes, fights or assaults involving weapons, and extrajudicial punishments.

In each survey year, IPA interviewed an average of 20 randomly selected residents per community and four non-randomly selected local leaders—typically a town chief, youth leader, minority group leader, and women’s group leader. IPA collected data on seven types of violence and 56 potential risk factors, including demographics, availability of social services, presence of natural resources, exposure to wartime violence, and incidence of adverse economic shocks, such as droughts and floods.

Researchers used the first two waves of survey data, from 2008 and 2010, and a variety of different statistical techniques to build models for predicting violence. They then used the models to generate predictions for where violence was most likely to occur two years later, in 2012. Then, in 2012, IPA collected data from the same 242 communities to see where violence had actually occurred, and researchers compared the models’ predictions to reality.

The models were intentionally designed to overpredict violence, the reason being that if a model predicted violence would occur somewhere and it didn’t, the cost could be wasted resources (e.g. from pre-emptively sending police to an area). Whereas, if a model predicted violence would not occur and it did, the consequence could be loss of life, destruction of property and persistent tensions between groups. To manage this trade-off, the researchers’ goal was to maximize correct predictions of violence (“true positives”), while maintaining an accuracy rate of at least 50 percent.

## Results and Policy Lessons

The best statistical model correctly predicted 88 percent of violence two years into the

future, though this performance came at a high price in terms of over-predictions. The model predicted violence four times more often than actual incidents occurred. Researchers believe that with further research this model or a similar one may be improved, generating fewer “false positives” while still correctly predicting most actual incidents of violence.

The model also found five risk factors out of 56 that reliably predicted violence:

- 1) **Power-sharing**, measured by an indicator for whether or not minority tribes and religions are represented in local leadership
- 2) **Town population**
- 3) **Ethnic polarization**, measured as the proportion of residents who describe other ethnic groups as “violent”
- 4) **Ethnic diversity**, measured as the proportion of residents who belong to the majority ethnic group in town
- 5) **Collective action**, measured as the proportion of residents who report contributing money or labor to public facilities

Violence was more likely to occur in communities that were larger, more diverse and more polarized. More surprisingly to researchers, violence was also more likely where multiple ethnic groups and religions were represented in local leadership (i.e. power-sharing). In fact, local-level power sharing was the single best predictor of violence in the best model. However, it is important to note this finding is a correlation, not evidence that power-sharing causes conflict. (One should consider that power-sharing is sometimes the outcome of negotiations following conflict, for example.) Investigating the roots of this correlation should be a priority for future research.

While it is unclear whether these models would perform well in other time periods or settings, the results suggest that relatively simple statistical models to predict violence may indeed be feasible. Peacebuilding researchers and practitioners should replicate similar exercises to identify which risk factors, if any, reliably predict violence across different time periods and settings. Replication will help develop fast, effective, and low-cost early warning systems for the future.

## Sources

[1] World Bank. [“Fragile states: good practice in country assistance strategies.”](#)

[2] Researchers identified the most destabilizing forms of local violence through a combination of formal qualitative research (e.g., interviews with local leaders) and informal conversations with peacebuilding actors.

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