

Terrorism in Colombia: The Revolutionary Armed Forces of Colombia and National Liberation Army

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Columbia has been in continuous civil turmoil since gaining independence from Spain in 1810. With the inauguration of former Colombian President Álvaro Uribe in 2002, the past 14 years have been the longest period of sustained military action against violent extremist groups in Colombia. The goal of this study is to analyze variation in attack intensity values over time, and identify changes in the spatial clustering of high attack intensity values in Colombia. Attack intensity values over time were measured for both groups to compare their respective levels of violence, and a Global Moran's I and cluster and outlier analysis were used to locate clusters of high attack intensities in Colombia. Results indicate that the average attack intensity ratings during the period of Álvaro Uribe's presidency were significantly lower than before and after his presidency. Additionally, attack intensity values were randomly distributed from 2012 to 2014.

Keywords: Colombia, terrorism, FARC, ELN, attack intensity, spatial clustering

Introduction

Modern conflict in Colombia began during the time period of *La Violencia* (“The Violence” – 1948 to 1958), in which nearly 200,000 people were killed. During this time, armed criminal groups adopted communist ideologies and began using guerilla warfare against the government of Colombia (Zackrison, 1989). During the mid-1960s, these guerilla groups rose to challenge the Colombian government and paramilitary groups on issues such as land ownership and political violence (Serres, 2000). The Revolutionary Armed Forces of Colombia—or *Fuerzas Armadas Revolucionarias de Colombia - Ejército del Pueblo* (FARC-EP)—and the

National Liberation Army—or *Ejército de Liberación Nacional* (ELN)—are two such terrorist organizations still operating (Zapata, 2003).

Data from the Global Terrorism Database show that the FARC and ELN have committed acts of terrorism in all of Colombia's 33 departments (provinces or districts) since 2000, with a total of 2,653 innocents killed, 4,060 wounded, and 1,495 hostages taken (Global, 2016). The FARC currently have approximately 7,000 soldiers, compared to the ELN's roughly 2,000 (Kyra, 2015; McDermott, 2014). When former Colombian President Álvaro Uribe was inaugurated in August 2002, he decided to take the fight to the FARC by utilizing Colombia's military to its full potential to wage war on the terrorist group. Offensive actions taken during Uribe's second presidential term ended in 2010 when he was replaced by current Colombian President Juan Manuel Santos. After a year of continuing Uribe's counter-insurgency policies, Santos abruptly changed strategy in November 2012 and returned to traditional peace negotiations as the primary method of conflict resolution with the FARC (Delgado, 2015).

Though this study does not use data regarding government military action, attack intensities will be used as a proxy for how successful Uribe's counter-terrorism policies were. Studying recent terrorism events in Colombia is useful in light of negotiations currently taking place between President Santos and the FARC and ELN (Gurney, 2014). As stated in Delgado's (2015) study, Santos's strategy is to injure the organization enough to make negotiations appear as the better avenue to resolution, rather than encountering the FARC on the battlefield.

Terrorism alone is not the only important factor in why studying Colombia is globally significant. "Some 4% of the world's population has consumed cocaine in his or her life. That's almost 300 million people. Approximately half of this cocaine comes from Colombia" (Alsema, 2015). From Colombia the cocaine travels by air, land, and sea to nations around the world, including all of North and South America, Australia, Europe, and select nations in Africa.

Although previous studies have examined conflict in Colombia, including the number of people killed, displaced, and affected (Sanín, 2006; Serres, 2000; Zackrisson, 1989; Zapata, 2003), the geographic component of violence and terrorism within the country has yet to be examined. Other studies with a spatial component lack the emphasis on a specific region or nation, and produce a less refined country-level or sub-country-level analysis of the geography of terrorism (Braithwaite & Li, 2007; Buhaug & Gleditsch, 2008; Enders & Sandler, 2006; Midlarsky, Crenshaw, & Yoshida, 1980; Nemeth, Mauslein, & Stapley, 2014; Siebeneck,

Medina, Yamada, & Hepner, 2009). This study is different from previous studies because it includes analysis of the number of people affected over time, as well as viewing the conflict at a country level. This study considers two specific and prominent non-state threat actors, focusing on the temporal and spatial distribution of these groups comparatively, both in-depth and side-by-side. To statistically examine spatial clusters of attack intensities in Colombia from 2000 to 2014, this work focuses on two specific research questions.

Statement of Research Questions and Expected Findings

Q1. How have attack intensity values varied temporally? Answering this research question will give great insight as to whether Uribe's anti-terrorism policies were effective in lowering attack intensity values during his time in office. If Uribe's policies were indeed effective, it will be shown in the results section. This question will be answered by presenting statistics of terrorism data and mathematically computing attack intensity values before, during, and after Uribe's presidency.

H1. It is expected that attack intensity values lowered during Uribe's counter-insurgency campaign from 2002 to 2010. It is also expected that after Santos's change in strategy in November 2012, attack intensity values increased as less military force was used against the terrorist groups.

Q2. Have high attack intensity values become more spatially clustered over time? Computing spatial clusters of attack intensity values in Colombia is a great way to discover how the FARC and ELN operate. High attack intensity values being clustered within specific geographic areas provide insight regarding group tactics and strategies, preferred attack areas, and rough location. This question will be addressed by computing a cluster and outlier analysis for both groups for years 2012, 2013, and 2014.

H2. Terrorism incidents remain prevalent in rural areas. Colombia is largely a rural nation with few major cities; therefore, a decrease of terrorism in urban areas might not influence country-level spatial clustering.

Literature Review

Terrorism Around the Globe

Terrorism studies have drastically increased in the years following the September 11, 2001 terrorist attacks in the United States. The majority of this research literature is focused on terrorism in the Middle East and Europe. Terrorism in these regions is relatively similar, in that

non-state actors use high intensity terrorist acts to produce mass amounts of destruction and injury to national infrastructure, government capability to combat crime, and the local populace (Siebeneck et al., 2009). Colombia, however, is a special case. These days in Colombia, terrorism is motivated by the continuation of the drug trade, while in Europe and the Middle East, terrorism is motivated by religious and political ideologies. Limited destruction has impacted the Colombian national infrastructure or the local populace, even with approximately 7,000 FARC and 2,000 ELN soldiers (Kyra, 2015; McDermott, 2014). It is for this reason the conflict in Colombia is referred to as a low-to-medium intensity conflict (Sanín, 2006).

Midlarsky et al.'s (1980) study of terrorism describes four patterns of geographical terrorism: randomness, heterogeneity, contagion, and reinforcement. Terrorism in Colombia is considered to be of the reinforcement category, which indicates "the experience of terrorism in one country increases the probability of its occurrence in the same country at a later point in time" (Midlarsky et al., 1980, p.265). Terrorist organizations in poorer nations, such as those in Latin America, develop by learning from terrorists in wealthier, more prominent nations (e.g., European countries). However, their analysis found the opposite to be true. Terror groups in Europe imitated behaviors of terrorist organizations in Latin America. Hence, terrorism in Latin America should be more of a focus in terrorism literature. A study of the tactics and activities used by the FARC and ELN might reveal patterns present in the actions taken by less prominent terrorist organizations around the globe.

The War in Colombia

Terrorism in Colombia was predominantly located in rural areas until 2003 due to financing from drug manufacturing and trafficking (Zapata, 2003). With continued income and support from other national and international terrorist groups, communist nations (namely Cuba), and the drug trade, the FARC and ELN see no reason to stop fighting for their cause (Zackrisson, 1989). Both groups use assassinations, bombings, armed assault, and kidnapping to cause terror in rural areas.

In Rosenau, Espach, Ortiz, and Herrera's (2014) study, the authors found that, in terms of recruitment, some members joined the organizations with a false sense of hope for good wages and a better life. However, this study also revealed that some members deserted for the same reasons. Out of a sample of 15,308 former fighters, 58.7% left because they desired a happier, healthier lifestyle or to avoid mistreatment. The authors also found that 13.6% of the fighters

sampled left their respective groups due to pressure from military operations, possibly the result of Uribe's aggressive counter-insurgency tactics.

Method

The primary purpose of this research is to examine spatial clusters of attack intensities of terror events during the recent period of sustained military action in Colombia. The analyses in this study use data from the Global Terrorism Database. Due to increased availability of terrorism literature since the September 11, 2001 attacks, as well as Uribe's counter-insurgency policies being put in place since 2002, data beginning from the year 2000 will be used. Using Microsoft Excel, the data was subset to Colombia only, and further subset to Colombia from year 2000 to 2014. This data was then displayed as a point layer from the latitude and longitude columns in ArcMap, and exported into a shapefile. It was then projected in the Bogota UTM Zone 18N Transverse Mercator projection. Once exported, ArcMap was used to subset only events perpetrated by the FARC and ELN.

A sub-district polygon spatial data layer was downloaded from ArcGIS Online. A simple formula was used to calculate the attack intensity ratings (A) for each quarter of every year from 2000 to 2014 (Siebeneck et al., 2009), where F = fatalities per quarter, I = injuries per quarter, H = hostages taken per quarter, and T = total terrorist attacks per quarter

$$A = (F + I + H) / T$$

This attack intensity rating is displayed in Figure 2.A for the FARC and Figure 3.A for the ELN, along with a line depicting total number of attacks per quarter of every year from 2000 to 2014. This method was used to standardize results. If just comparing total number of attacks between the FARC and ELN, a great disparity is shown. Using attack intensity values for the 2000 to 2014 study period, these groups can be compared. What the attack intensity values reveal to the reader is the average amount of violence (through those killed, injured, and hostages taken) per quarter of every year.

To compute a Global Moran's I , as well as the cluster and outlier analysis, terrorist attacks were first separated by year, and then inserted into the departments of Colombia shapefile via spatial join in ArcGIS. As a parameter for the spatial join tool, a one-to-one join was used, and the number of people killed, wounded, and hostages taken were summed within each column. Within the new join shapefile, a new column of data type float was created and the attack intensity formula displayed above was performed using the field calculator. The Global

Moran's I is a statistical method for computing the spatial distribution of attack intensity values of attack locations throughout Colombia to determine if they are located randomly, spatially clustered, or both. The cluster and outlier analysis is similar, but used for computing which departments in Colombia have experienced high attack intensities. A Global Moran's I, as well as a cluster and outlier analysis were chosen to give better insight into the spatial distributions of attack intensity values throughout Colombia.

The first research question was answered mathematically by computing the average, standard deviation, and range of attack intensity values for the FARC and ELN. Values were computed for before, during, and after Uribe's presidency for the 2000-2014 study period. Two types of analyses were used to answer the second research question, those being (1) Global Moran's I, and (2) a local cluster and outlier analysis (LISA). Since the departments of Colombia were used in these two processes, spatial neighbors were defined as such, using inverse distance as the method for calculating the results. A new shapefile was created for the joins for each group from 2012-2014. A Global Moran's I was then computed for both the FARC and ELN, using these attack intensity values for the same period to determine whether attack intensity values within departments of Colombia were spatially random or clustered. After all six shapefiles of the attack intensity values for 2012-2014 were created, a Global Moran's I was created for both groups from 2012-2014. This calculation created six different outputs; more specifically, a 2012, 2013, and 2014 output for both the FARC and ELN.

Results

Once the methods and analysis were complete, several confirmatory, as well as unexpected, results were derived. In answering the first research question, the results were confirmatory, revealing that Uribe's tough counter-insurgency policies were effective in decreasing the average attack intensity values for both the FARC and ELN. In answering the second research question, it was found that high attack intensity values were not more spatially clustered throughout time.

Terror incidents implemented by the FARC vastly outnumber those of the ELN. To normalize the data, an attack intensity rating was chosen (Siebeneck et al., 2009). During the 2000-2014 period in Colombia, 1,145 acts of terror were committed by the FARC, compared to 228 by the ELN. Exploring the average number of terror attacks perpetrated by the FARC during this time period revealed a mean of 76.3, with a standard deviation of 40.4 events, and a range of

23-163. Attacks by the ELN during this same time period showed a mean of 15.2, with a standard deviation of 17.9 events, and a range of 0-56 (Figure 1).

Though the number of attacks carried out by the two groups varied drastically, the attack intensity ratings derived from both groups are similar. The FARC's mean attack intensity rating for the 2000-2014 time period is 6.2, with a standard deviation of 5.7, and range of 0-38.67 (Figure 2). The ELN's mean attack intensity rating for the same period is 6, with a standard deviation of 10, and range of 0-50 (Figure 3).

Research Question 1

In answering the first research question (How have attacks varied temporally?), the analysis showed that the average attack intensity value for the FARC and ELN decreased during Uribe's two terms in office (Table 1). The FARC's upper range of 38.67 is due to a spike during the third quarter of 2006, the FARC's highest attack intensity value of the entire 2000-2014 period. Though the standard deviation, as well as the upper range of attack intensities, has risen for the FARC during Uribe's presidency, the average intensities of the attacks dropped slightly.

A drop in attack intensities is much more prevalent with the ELN. Similar to the FARC, the ELN attack intensity value spiked to 28.0 during the third quarter of 2002. The average attack intensity value for the ELN during Uribe's presidency, however, dropped dramatically from 13.49 to 2.96, then remained at 3.53 from 2011 through 2014. This decrease in attack intensity values might suggest that Uribe's counter-insurgency policies were much more effective in combating the ELN, though effects can also be seen with the FARC. There are, however, other possible explanations for the decrease in attack intensity values, including a lack of data before and after Uribe's presidency, or possibly the focus of the FARC and ELN on terrorism being redirected to protecting territory.

The graph in Figure 2 includes a comparison of attack intensity ratings with the number of attacks for FARC during the 2000-2014 study period. Figure 2 illustrates that, although the attack intensity rating has remained steadfast during Uribe's terms in office, the number of attacks committed by the FARC decreased. Attack intensity values, as well as number of attacks committed by the ELN, changed more dramatically during Uribe's time in office. Prior to Uribe's presidency, the average ELN attack intensity value was 13.49, dropping to 2.96 during his presidency. Likewise, the standard deviation of attack intensity values was at a high of 19.71 for both the FARC and ELN during the study period, but dropped to 5.78 during Uribe's

presidency. According to the data, there was a combined three-year period where no attacks were committed by the ELN, resulting in no attack intensity rating.

In a similar analysis, the plot in Figure 3 compares the attack intensity ratings and the number of attacks for the ELN. The attack intensity rating for the ELN spiked to 60.5 during the second quarter of 2001, and rapidly declined to the point of no attacks from the fourth quarter of 2003 until the second quarter of 2005. It is important to note that ELN attack intensity values were higher than the number of attacks committed. Alternatively, the FARC's attack intensity values were lower than the number of attacks committed. As mentioned, Colombia is considered a low intensity conflict. Nonetheless, the ELN is a terror group, which commits slightly high attack intensities when compared to the FARC. Though they are smaller in number and commit much fewer attacks, their attacks are often more violent and cause more harm to their targets. Therefore, it can be concluded that in terms of the first research question, the FARC and ELN differed greatly in the total number of attacks for the study period; however, the attack intensity values for the ELN were higher than the total number of attacks committed for the 2000-2014 period.

Research Question 2

A Global Moran's I calculation was used to answer the second research question: Are terrorism events becoming more spatially clustered through time? For both groups, the z-scores and *p* values were computed using Global Moran's I from attack intensity values for years 2012, 2013, and 2014 (Table 2). The Moran's I for the FARC between 2012 through 2014 remain between 0.227 and -0.031, and appear to be randomly distributed for the study period. Similarly, the Moran's I for ELN also appear to be randomly distributed. Given the results, terror attacks consistently remain randomly distributed through time and do not appear to be becoming significantly more or less spatially clustered.

Figure 5 displays attack locations within Colombia from 2012 through 2014 committed by the FARC (yellow) and ELN (red). Figure 6 displays attack locations from 2000 through 2014. To answer the second research question, the cluster and outlier analysis tool in ArcGIS was run six times, once for each group (FARC, ELN) in 2012, 2013, and 2014. Attack intensity values were used as the input field (Figure 4). Figure 4 depicts all high-high, high-low, low-high, low-low, and non-significant values for all departments of Colombia. Throughout the 2012-2014 study period, a total of three departments displayed high-high attack intensity clustering,

according to the given attack intensity values. Another three departments displayed high-low outlier values, given their corresponding attack intensity values. The remaining departments of Colombia resulted in non-significant, as there were no low-high outliers or low-low clusters found. These results indicate that clusters of attack intensity values remained randomly distributed from 2012 through 2014.

No results were found for the ELN from the cluster and outlier analysis. This is likely due to the limited number of attack intensity values corresponding to each department of Colombia from 2012 through 2014. With limited values to input within each department, no clusters were found. These results indicate that the ELN lacked the number of attacks, and corresponding attack intensities, to be studied with a cluster and outlier analysis method.

Terror attacks committed by the FARC and ELN mainly occurred in rural areas, as displayed with point locations from the START Global Terrorism Database data used in this study. Due to most terror events being located in rural areas, the difficulty for the government of Colombia to combat the terror groups is high. Areas distant from military facilities, difficult to travel to or through (mountainous/dense regions), and near international (or across) borders—not to mention the added difficulty of local support—make the problem of fighting these groups exponentially more difficult (Buhaug & Gleditsch, 2008; Nemeth et al., 2014). Though Colombia was not studied specifically, all of these factors are present within Colombia today. Buhaug and Gleditsch researched civil war, specifically the cause of violent conflict within societies. In their 2008 study, the authors found that local support, international borders, and rough terrain can impede government capabilities. Colombia was mentioned in Nemeth et al.'s (2014) study. They also found that rugged terrain, proximity to international border(s), and local population significantly impact the ability to relegate terrorist activity.

Limitations

Several limitations exist in this study. The first limitation comes from the Global Terrorism Database provided by START at the University of Maryland, College Park. During the 2000-2014 period, 231 out of 1,739 terror events were committed by unknown perpetrators within Colombia, and 134 terror events were identified as having been committed by groups other than the FARC or ELN. The analysis for this study simply compares known terror events committed by the FARC and ELN. If terror events committed by all known terror groups were

known, this study may have yielded different results. Likewise, if the 231 terror events perpetrated by an unknown group were known, the results may have been far different.

Results for the ELN cluster and outlier analysis were limited by the number of attack intensity values perpetrated by the ELN during the study period. Only four departments of Colombia had attack intensity values for 2012, five for 2013, and 10 for 2014. This is in comparison to the FARC's 15 for 2012, 16 for 2013, and 18 for 2014. If more attack intensity values were available to compute a cluster and outlier analysis for the ELN, actual results would have been computed. Additionally, both the Global Moran's I and the cluster and outlier analysis methods used Euclidean distances as a parameter to measure distances between the departments of Colombia within the computation and not a road network. By using a road network, thereby increasing the distances between the attack intensity values, the values derived for the Global Moran's I would most likely be increased, and perhaps fewer or no clusters of high attack intensity values would have been found.

Conclusion

The war on terrorism in Colombia appears to be a long way from being won. However, according to previous research findings and the results of this analysis, the situation is a low-intensity conflict. Low-intensity conflicts are preferred to high-intensity conflicts (e.g., conflicts in the Middle East) due to fewer casualties being inflicted on the local populace. In answering the first research question, this study suggests that attack intensity values varied dramatically throughout the 2000-2014 study period, especially for the ELN. The average attack intensity value for both groups dropped during Uribe's presidency from 2002-2010; however, the range and standard deviation for the FARC increased due to a spike in attack intensity values during the third quarter of 2006. The results for the second research question suggest that attack intensities remained randomly distributed throughout Colombia. It was also discovered that local clusters could not be found for the ELN due to a lower number of attacks and corresponding attack intensities. Overall, these results indicate that during the time period of former President Uribe's counter-insurgency policies, average attack intensities dropped, but attack intensity values remained randomly distributed throughout Colombia.

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Appendix

Data used comes from the Global Terrorism Database. The author generated the figures; they are his intellectual property.

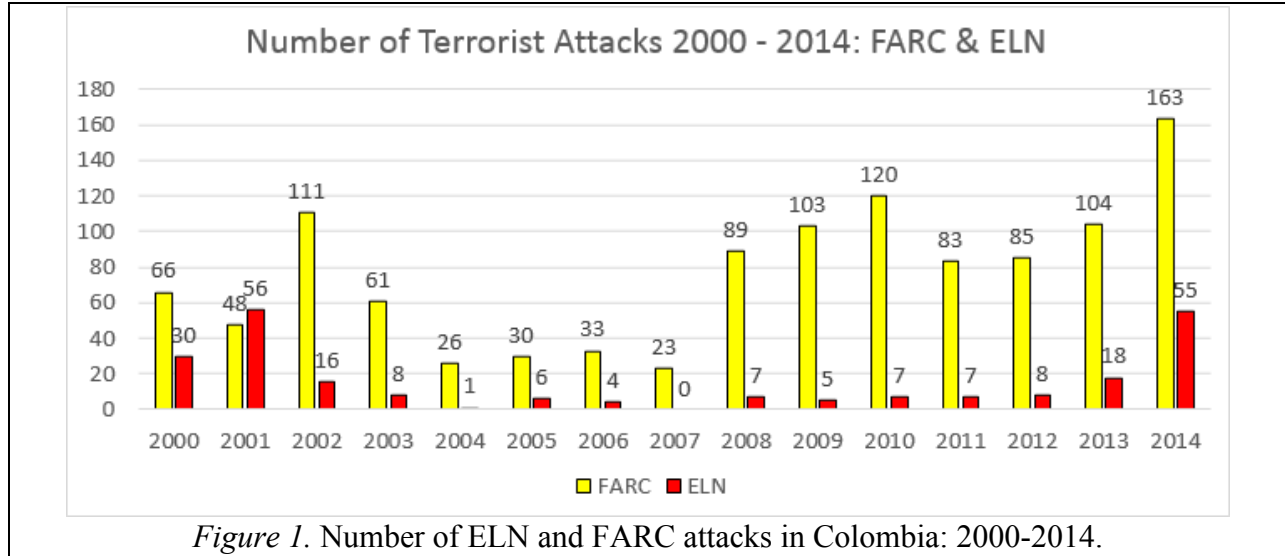


Figure 1. Number of ELN and FARC attacks in Colombia: 2000-2014.

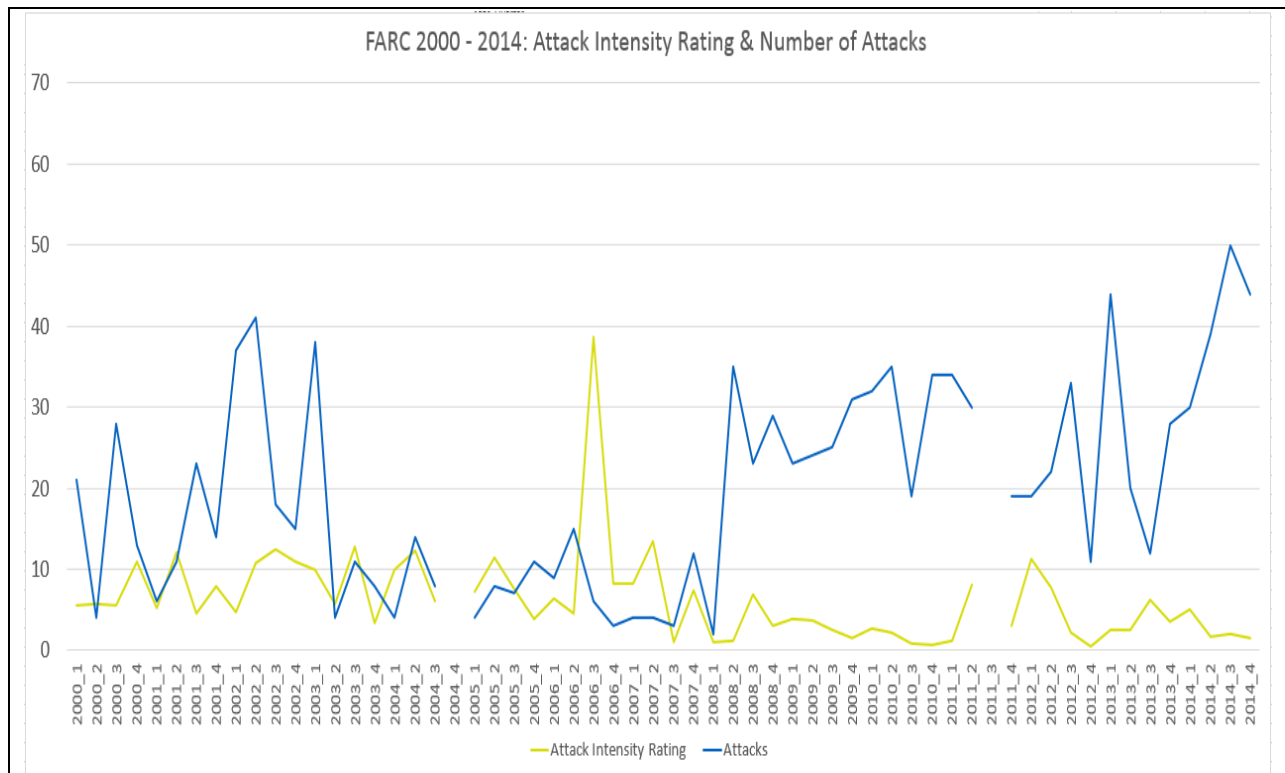


Figure 2. Attack intensity rating/number of attacks committed by FARC from 2000-2014.

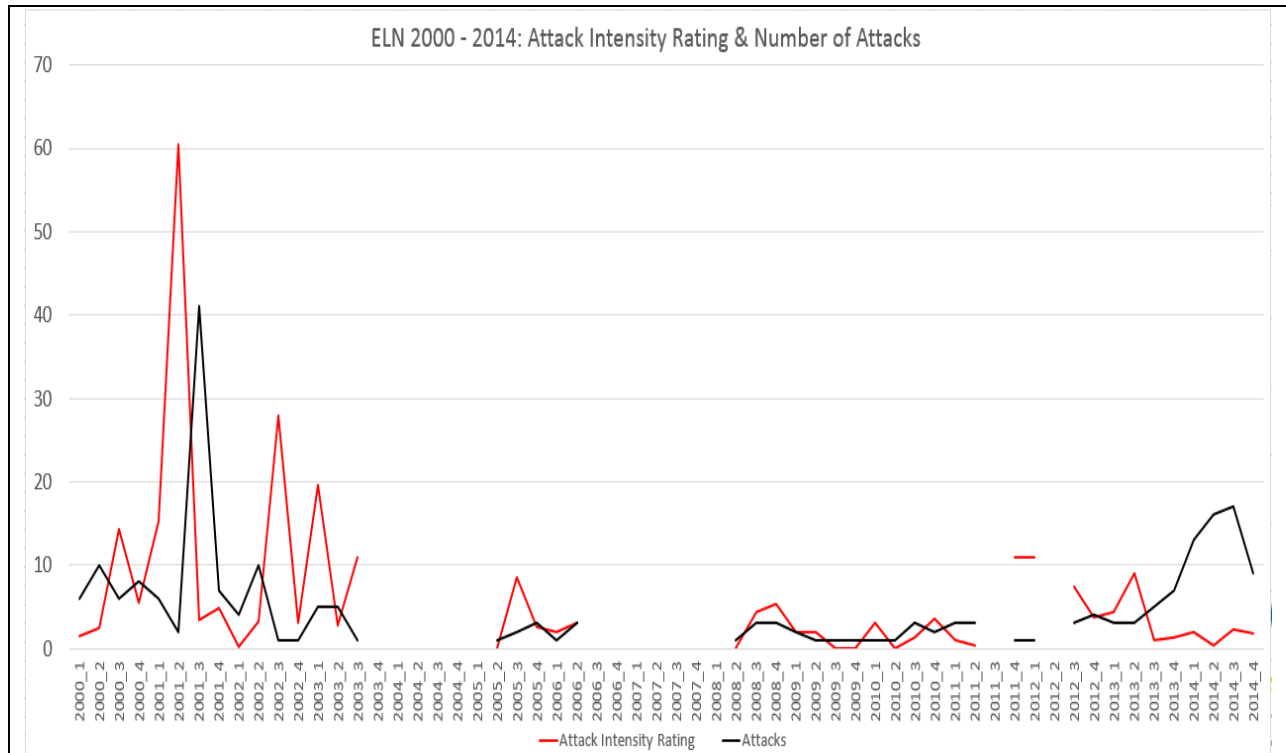


Figure 3. Attack intensity rating/number of attacks committed by ELN from 2000-2014.

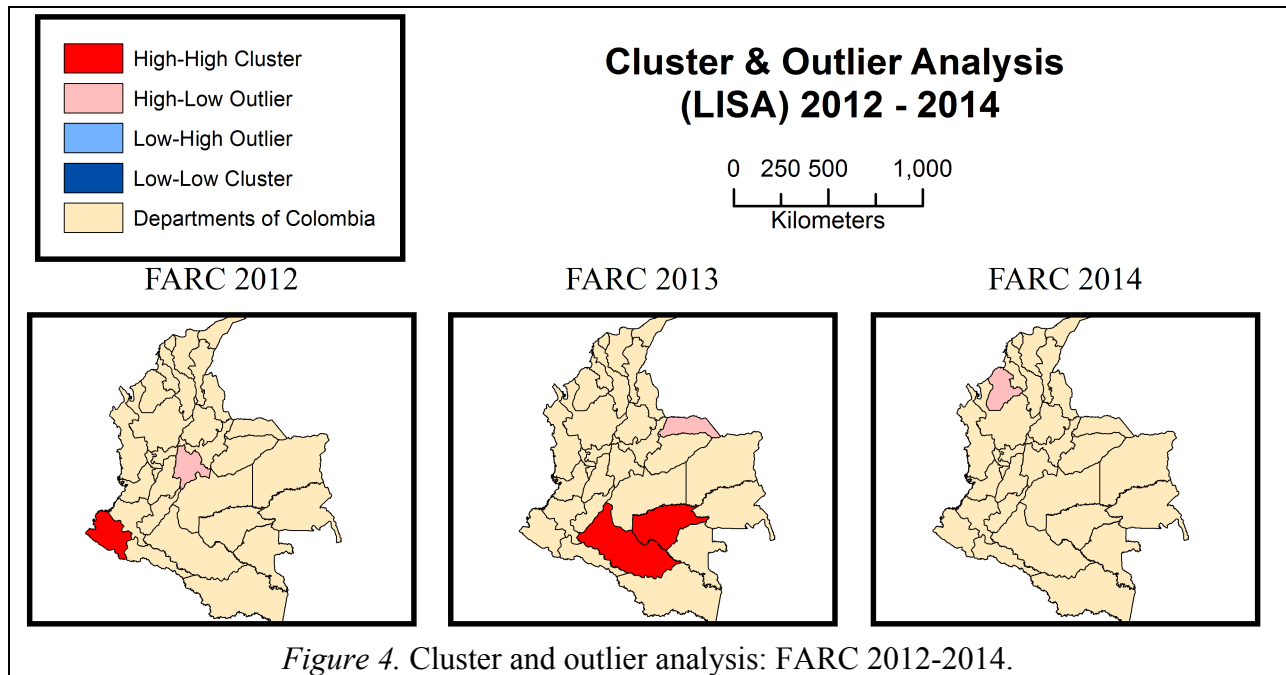


Figure 4. Cluster and outlier analysis: FARC 2012-2014.

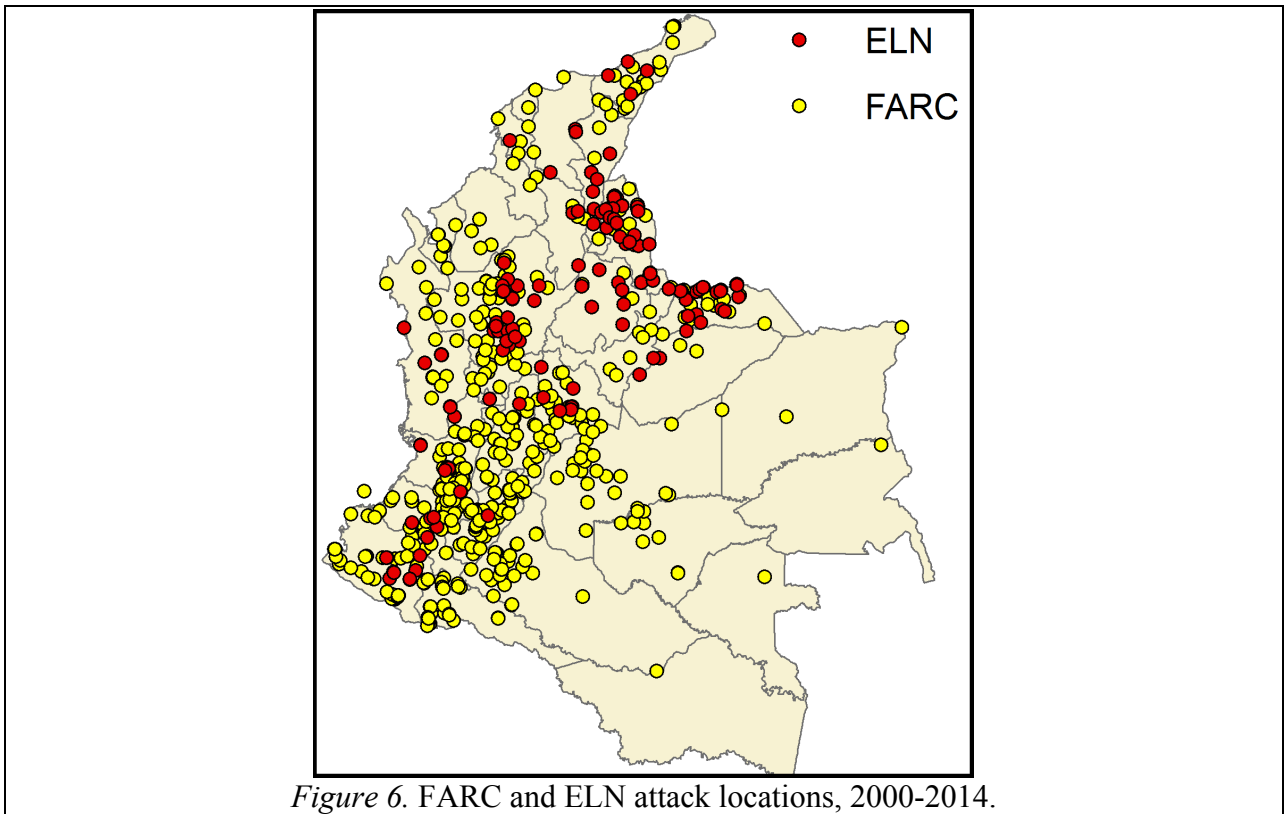
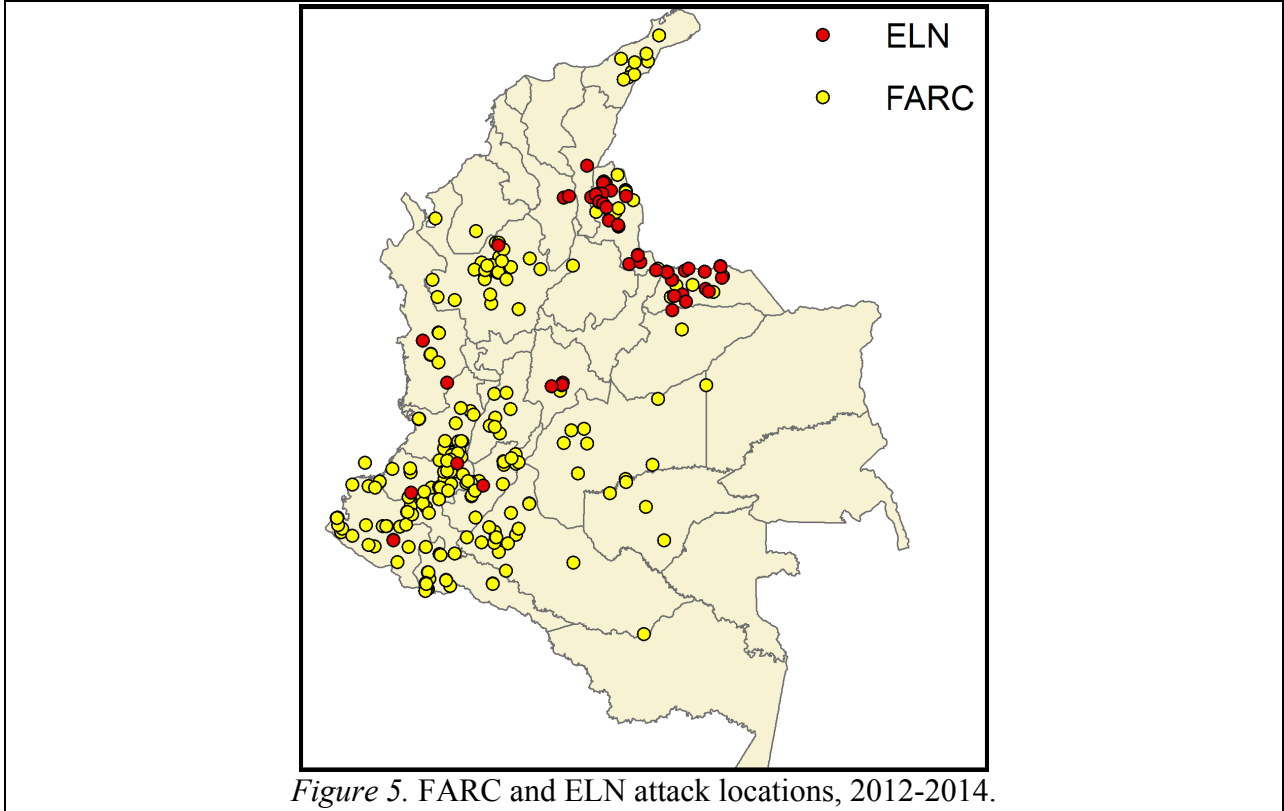


Table 1

FARC and ELN average, standard deviation, and range of attack intensity values before, during, and after Uribe's presidency

FARC			
Avg.	7.22	6.89	8.03
Std. Dev.	2.90	6.67	3.30
Range	4.57-12.20	0.0-38.67	3.38-12.73
Years	2000-2001	2002-2010	2011-2014
ELN			
Avg.	13.49	2.96	3.53
Std. Dev.	19.71	5.78	3.88
Range	1.50-60.50	0.0-28.0	0.0-11.0
Years	2000-2001	2002-2010	2011-2014

Table 2

Moran's Index and corresponding p values of attack intensity values for the FARC and ELN from 2012-2014

Years		2012	2013	2014
FARC	Moran's I	0.227	0.165	-0.031
FARC	p value	0.6159	0.3445	0.9836
ELN	Moran's I	-0.008	-0.065	0.047
ELN	p value	0.7041	0.7397	0.4843