

Extended Abstract

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Colombia has experienced different phases of violence during its history, ranging from periods of extreme conflict with some of the highest rates of homicides in the world (Medellin, the capital city of the province of Antioquia had a homicide rate of 375 per 100,000 inhabitants in 1991) to ones of relative peace (in 2015, Medellin tallies a homicide rate slightly below the national average: 25.07 deaths per 100,000 inhabitants). Previous studies had acknowledged who had been the fatal victims of violence at a national level from a demographic perspective. But at a regional level the expressions of violent deaths in time and intensity for each of the 33 provinces of the country are still unknown. So far, there has not been an study who analyzes violent mortality for all of the provinces of the country in this period between 1979-2016, which has four distinctive phases: a pre extreme violence phase (1981-1985), a first phase of extreme violence with preponderance drug cartels violence (1991-1995) a second phase in which the political armed conflict was responsible for the bulk of deaths in the country (2001-2005) and a phase of post extreme violence, in which homicide rates lower to historical lows in the country. For more than 50 years, Colombia has had an environment of widespread violence due to its internal armed conflict which has confronted leftist guerrillas, right wing paramilitaries, drug cartels and organized crime with the state forces of the nation . Although classified as a "low intensity" internal war, it has had extreme repercussions in certain regions of the country. Overall, 8.1 million out of 49 million inhabitants of Colombia have been classified as victims of the internal armed conflict.

As previous studies have identified, the contexts of violence permeate all space, time and setting of social and individual life (Franco Agudelo, 2003 cited by Acosta, Torres, Silva-Ramirez and Borbeau, 2018) while the diversity of contexts, scenarios, types, and meanings of violence and permanent changes in its dynamics and intensity (...) *makes it necessary to define in each case what violence is referred to and in what temporal space coordinates is located* (Franco Agudelo, 2013) Considering this, the analysis of mortality from violent causes must take into account both the sociopolitical context and the geographical expression of the phenomenon in order to identify the local impacts and concentrations of violent mortality, which will show how and when the violence affected each of the provinces of the country and will highlight the geographical patterns of violent mortality in Colombia

We still don't know how much of the mortality burden is caused due to violent deaths in each of the provinces of Colombia and when violent mortality was concentrated in each region. So the question arises: does each province of Colombia had a behavior of violent deaths similar to the overall trend of the country? And if not, how the differentiated characteristics of violent mortality in terms of intensity and occurrence are expressed in each of the provinces of the country in the period of study?

To answer this question this paper describes and compares the main characteristics of external mortality due to violence in each of the 33 provinces of the country in light of the consecutive socio-historical phases of violence. Within each period, we analyze the violent mortality focusing on the differences by sex, age and potential demographic costs in terms of life years lost and we compare the behavior of each of the provinces in Colombia in light of the overall violent periods that affected the whole nation.

Colombia is demographically diverse, but the territorial expressions of mortality due to external causes associated to aggressions still generate serious uncertainties and are fertile ground for research. In a long-term perspective, we could identify territorial patterns of violence and how they evolve in different phases of the conflict. This study goes beyond mere scientific curiosity or the desire to improve the mortality registers, which show weaknesses at a regional level (Urdinola, Torres and Velasco 2017).

Data and Methods

Death counts by age and cause

7,566 deaths are registered as related to legal operations and war situations for the period of observation, a figure with massive underregistration (Acosta et al, 2018) that does not show the murder of civilians associated with the armed conflict. There are estimated at least 10,000 extrajudicial killings known as “falsos positivos” –civilians presented as casualties of combat by the army- between 2002 and 2008. On the other hand, the national center for historical memory (CNMH, 2018) estimates that 39,238 fighters were killed in violent events associated with the internal conflict between 1976 and 2016. Given that deaths by legal operations and war seem to be underestimated while homicides appear to be overestimated, we follow the category proposed by Acosta et al (2018) in which deaths related by conflict and homicides are aggregated in a single category called Aggressions.

During the study period 1979-2016 Acosta et al (2018) found that 70,761 cases were registered as violent deaths with undetermined intent. This is not a negligible amount; it even exceeds the total number of deaths by suicide (61,278). In 1997, for instance, for each death by suicide there were 3.7 violent deaths with undetermined intention. When they examined the evolution of this cause of death over time, as well as the form of death (e.g. the kind of object that caused the death) two aspects stood out: first, there were two sudden increases of around 700% (followed by proportional decreases), which occurred precisely in the first year of each phase of extreme violence.(Phase I: 1981-1985 pre extreme violence, Phase II: 1991-1995 drug cartel related extreme violence, Phase III 2001-2005 Conflict related extreme violence, Phase IV: 2011-2015 post extreme violence) Second, most of those increases (90%) corresponded to deaths involving weapons (either firearms or sharp objects). Excluding those two aberrant increases, they estimated a mortality baseline corresponding to around 2.1% of deaths by homicides and suicides combined for each period. Using that baseline, Acosta et al (2018) estimated an excess of 14,305 deaths with undetermined intent which were imputed to aggressions

The category Aggressions represents all violent deaths intentionally inflicted, since it was obtained by adding the original counts of registered homicides, the imputed deaths of homicides with undetermined intent and the homicides with no declared age (which were attributed using the known distributions of age at death). the category aggressions includes 746,922 deaths, of which 40,053 were imputed.

Age standardized death rates

The use of age standardized death rates of violent deaths will allow us to measure the level of violent mortality by identifying the national rate and each of the different rates per year of the 33 Colombian provinces.

This will allow us to compare the mortality rates of violent deaths in each province with the national average, showing the differences between the provinces and the nation. The age standardized mortality rates per year and age group can show the concentrations of mortality in each of the provinces. Higher mortality rates could be shown in a detailed lexis map allowing to visualize in which periods the violent mortality was higher and which age groups were the most affected by violence in each province, presenting the possible geographical patterns in terms of concentration of mortality rates at similar periods of violence and extreme violence. This will allow to compare if the provinces of the country behave similarly in the periods of extreme violence already identified for the whole country or if on the other hand the provinces experienced different concentrations of mortality rates in periods of low or medium violence.

Years of life lost

In order to assess the potential demographic cost of violence, we chose to calculate the average number of life-years lost by cause of death on each period of analysis. This indicator, as a summary measure of premature mortality provides a way of determining the impact of deaths related to violence in Colombia. As stated by Martinez et al (2019) *“years of life lost due to premature deaths is an accurate measure for assessing the impact of diseases, injuries and risk factors on premature mortality.”*

With this indicator, we can show the burden of violence for mortality in Colombia, and how it has affected different age groups in different regions. Comparing the years of life lost to violence vs other causes of death can illustrate the impact that violence has had on mortality in each region of the country and if this situation has been an important factor that impacts the mortality pattern of the provinces in Colombia. We intend to use the method proposed by Andersen et al (2013) which provides numerous advantages. Given its reliance on life-table data, this method allows a straightforward relationship with the life-table of the population under study and each province in Colombia has a different life expectancy either lower or higher than the national average. Additionally, the method allows great flexibility, as the life-years lost by cause can be calculated within each age-category, as well as cumulatively from birth until a given age of interest.

First results

First results show indicate a large male-disadvantage in survival. That disadvantage was primarily driven by exceedingly high levels of aggression-related mortality among males. For instance, in 1991 (the most violent year), more than one in four male-deaths were due to aggressions (27.2%, vs. 3.3% among females). Potential life-years lost show that mortality by aggressions for some particular regions surpasses the loss of life by circulatory diseases, which is the main cause of years of life lost for the whole country. In provinces like Antioquia at 1990 violent deaths contributed more to the loss of life years than other causes of death, displaying a very high mortality related to cartel violence. This pattern, however, is not the same for all provinces in the country. Some regions do not experience this trend. Violence does not express at the same moment or at the same intensity, and it does not contribute the same in each province to the years of life lost.

When we compare the different provinces in Colombia categorized by its socio economical characteristics and their mortality rates, we can identify that regions deemed as “developed” have had extremely high scenarios of violence. Provinces like Antioquia, which is the second highest gross internal product province per capita has had record mortality rates in periods of extreme violence of drug cartel related killings.

The regional mortality patterns we map with this study can show the moments and intensities of regional expressions of violence, and show that these expressions can differ from the overall pattern of the country. Also, preliminary result suggests that there is no clear correlation between the level of development of the provinces and the rates of external mortality related to violence and aggressions. Not only the underdeveloped regions have experience violence or the record rates of aggressions in the country.