
POLICIA
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AN ANTIDOTE TO MURDER

City leaders across the Americas are exploiting science to reduce homicide

BY RODRIGO GUERRERO VELASCO

VIOLENCE IS A BIG PROBLEM IN MODERN SOCIETY AND IN CITIES IN PARTICULAR. HOMICIDES WERE RAMPANT in my hometown of Cali, Colombia, when I became mayor in 1992. Few people saw murder as a pressing health problem, but I did—probably because I had earned a Ph.D. in epidemiology at the Harvard School of Public Health. I decided to apply the statistical methods used by public health experts to identify the sources of homicide and to reveal social and policy changes that might make a difference.

At the beginning of my first term, the people of Cali and all of Colombia generally believed, mistakenly, that little could be done because we Colombians were "genetically violent." Other skeptics maintained that violent crime would not diminish unless profound changes were made on socioeconomic issues such as unemployment and educational levels. My administration and I proved all these people wrong.

We developed an epidemiological database about the many societal factors that significantly raised the risk that a homicide would happen. These included sometimes subtle aspects of human behavior, such as the desire to carry guns in certain places or the tendency to drink alcohol on certain days. This exhaustive and fine-grained information led to new laws and policies built on data, not politics.

The method worked. In 1994 annual homicides in my city, then home to nearly 1.8 million, dropped from 124 per 100,000 residents to 86 in just three years after the leading causes were found and policies were applied. An even larger decline took place over nine years in Bogotá, after our capital city adopted the same methods. And when I was elected mayor of Cali for a second time, in late 2011, after being out of office for almost 18 years, the same approach reduced homicide rates again. Let me tell you the story of how big data and scientific analysis can help solve entrenched social problems.

PINPOINT THE ROOT CAUSES

WHEN I BEGAN my first term, I did what epidemiologists generally do: plot cases on a map. I hung a big printout of Cali on my office

wall and stuck color-coded pins in it at each location of a death, intentional injury, traffic accident, home burglary or other violent event. When a journalist saw the map, his local newspaper ran a headline that read: "Mayor Guerrero Intends to Curb Violence with Acupuncture."

Even to smart journalists, evidently, it was strange to look at homicide in a statistical way. But to me, it made perfect sense: if epidemiological methods could find the causes of medical diseases, they could find the causes of a societal disease.

Using statistics was crucial because Colombia had a long record of violence that left many misimpressions. Beginning in the late 1940s, *La Violencia,* a fierce struggle for power between the two main political parties, sparked over 200,000 killings across more than 10 years. Guerrilla warfare followed for decades. The cultural tolerance for violent responses to conflict was so high when I took office that quarrels between neighbors or drivers in traffic accidents frequently ended in homicide. In 1991 Medellín, the second-largest city in Colombia, had an annual homicide rate of 380 per 100,000. Around that time, Chile's rate was 2.9.

My epidemiological approach began with a definition of violence scripted by the World Health Organization: the use of force with the intention to cause harm or death. This definition does not include accidents or psychological or political violence.

Despite the media's preoccupation with domestic warfare, only 36 percent of the deaths in Colombia in 1991 were caused by guerrillas, mostly in rural areas. I thought drug dealers would arise as the culprits in the other 64 percent. As we investigated the who, where and when of each death in Cali, however, we found that homicide victims and aggressors were predominantly young, unemployed males who had low levels of education, came from the poorer sectors of the city and were frequently involved in gang fights. We also found that close to 80 percent of homicides were carried out with firearms. When we discovered that two thirds of homicides took place on weekends, we decided to chart blood alcohol levels in victims; more than half of them had been intoxicated. These facts pointed to social disintegration more than drug-related violence.

Drug traffic still had an effect, but it was not the direct cause of most homicides. As we analyzed the numbers, we realized that drug traffic was to society as HIV is to the human body: the virus attacks defense mechanisms, making the body vulnerable to other diseases. Likewise, drug dealers attack the police and the judiciary and political systems—the defense mechanisms of society. These weakened institutions arose as risk factors for violence. For example, the police identified a suspect in only 6 percent of homicides, and the judiciary system brought even fewer to trial.

Also, children were often exposed to violence and maltreatment, and violent content was prevalent in the media. In a culture of violence, economic inequality and ineffective public security, people killed and got killed, often under the influence of alcohol, over conflicts as simple as noisy neighbors or settling debts.

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has been mayor of Cali, Colombia, since 2012. He was also mayor from 1992 to 1994. After his first term, he worked for the Pan American Health Organization and helped to start VallenPaz to create economic programs in guerrilla-infested and illicit drug-producing rural Colombia.

CHANGE THE CULTURE

OUR GOAL WAS TO REVEAL risk factors we could control directly. Because firearms were used in a large proportion of homicides and alcohol was often associated with the deaths, in November 1993 I began to change gun and alcohol laws.

In my country, guns are manufactured and sold by the Colombian National Army, so military authorities opposed my idea of a permanent ban on weapon-carrying permits. But they agreed to our suspending the permits in public places on select dates identified by the data as posing a high risk, which was generally associated with high alcohol consumption. These dates included New Year's Eve and (strangely) Mother's Day, as well as days when payments to employees, made on the 15th and 30th of each month in Colombia, coincided with a Friday.

I also restricted alcohol sales in public places after 2 A.M.—a measure my administration called the semidry law. Nightclub owners objected adamantly, so I proposed a deal: I would apply the law for three months, and if violent deaths and injuries did not diminish, I would drop it. After only two weeks, hospitals reported such a drastic reduction in violence-related emergencies that abandoning the measure was not an option. I enforced the semidry law until the end of my term.

An epidemiological strategy also calls for evaluating interventions. After several months, we found that when both alcohol sales and firearms permits were restricted, there was a 35 percent reduction in homicides versus days when neither were in force. The reduction was 14 percent when firearms alone were restricted.

Other interventions included adding more prosecutors, as well as putting more police on the streets and improving their equipment, such as surveillance cameras, cars and radios. To support these people in their challenging careers, we launched a privately funded program to help police officers become homeowners and gave computers and training to members of the judiciary. Crime prevention rose, and more suspects were brought to trial.

We also created two Houses of Justice—premises within violent neighborhoods on the outskirts of Cali in which all law-enforcement institutions operated 24 hours a day. Previously these services were available only downtown and during business hours. This change was particularly helpful in reducing domestic violence because investigations would begin immediately after fo-

IN BRIEF

An epidemiological approach of data analysis can reveal the root causes of violence and the best steps to curtail it. **In Cali, Colombia,** the method reduced homicides from 124 per 100,000 inhabitants to 86 in just three years. In Bogotá, the rate dropped from 80 to 20 over nine years.

Changes in gun and alcohol laws were crucial. So were increasing police presence and giving youth social activities and jobs.

Today numerous cities across the Americas hold regular meetings of all crime agencies to analyze data, plan interventions and evaluate them.

rensic medical personnel certified a victim's injuries, which lessened the chance that women would withdraw their complaints under pressure from their husbands. In an effort to offer young males in poor districts greater opportunities for education, recreation, income and social connections, I launched DESEPAZ—a program to restore public safety by improving the cohesiveness of a neighborhood. As part of the program, we opened "youth houses" in several communities where people could socialize and gather around cultural and sports activities. City workers also trained youth who were involved with gangs to run small businesses. The city even hired one such business dedicated to manufacturing cobblestones to pave streets.

IMPROVE THE DATA

WE REALIZED EARLY ON that the data we were working with were not always cohesive. For example, in my first security council meeting in July 1992, it became clear that the police and judiciary used different definitions of homicide, which complicated our efforts to pin down causes of deaths. To fix the issue, I established weekly security meetings that involved officials from the police, judiciary and forensic authorities, members of the Institute for Research and Development in Violence Prevention and Promotion of Social Coexistence (CISALVA) at the University of Valle, cabinet members responsible for public safety, and the municipal statistics agency. Information was reported weekly to me and to police commanders. We held a security council meeting every week of my term. Slowly the data coalesced. The meetings evolved into "observatories of crime," sometimes called "social observatories." CISALVA, which is dedicated to studying violence prevention, has kept the observatory's weekly data running for 22 years—to my knowledge, the longest reliable set of information on violence in any Colombian city.

Based on the improved analysis of risk factors, we began interventions at the end of 1993 and widened them before my two-and-a-half-year period as mayor ended in December 1994. My successor continued them. The homicide rate in Cali dropped from 124 per 100,000 in 1994 to 112 in 1995, 100 in 1996, and 86 in 1997. It is difficult to say how much of the decline was a direct result of the interventions because the national government was also changing how police fought drug cartels. But evaluations in Cali and Bogotá confirm that the epidemiological approach played an important role. I believe that is true in part because the mayors who followed my successor did not keep in place unpopular measures such as the restriction of alcohol consumption, and the homicide rate climbed back up.

Experience in Bogotá, the country's largest city, backs up the data-intensive method. When Antanas Mockus became mayor there in January 1995, he applied and improved our strategy. His most important tactical interventions were increasing the police budget 10-fold, improving police education about violent crime, developing temporary detention centers for minor offenders and creating a government position of subsecretary of violence prevention. The social interventions included rebuilding dilapidated public spaces and tripling investment in health and education.

Mockus also implemented a semidry law and restrictions on firearms, which quickly reduced homicide rates as much as they had in Cali. In Bogotá, strict use of the epidemiological method spanned three administrations over nine years, from 1995 through 2003. Across that time, homicide rates dropped from 59 per 100,000 to 25. As in Cali, some of that improvement may have been helped by changes at the national level.

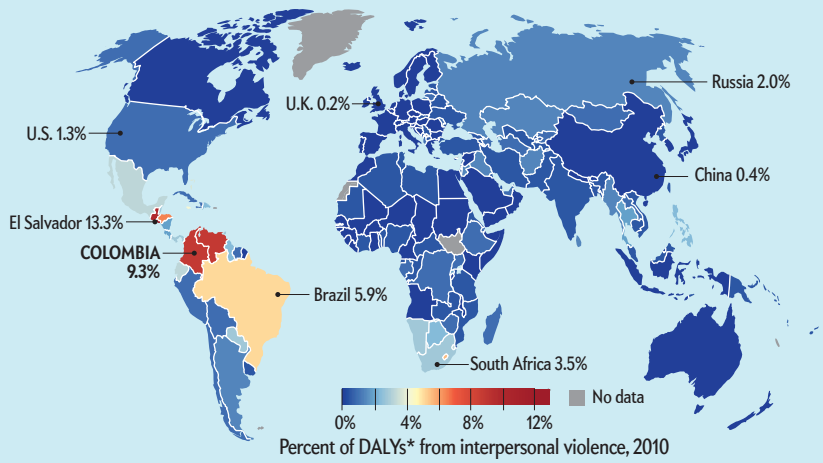
NEW TACTICS, 20 YEARS LATER

IN COLOMBIA, mayors cannot be reelected consecutively (and I had other plans anyway). After I left office, I dedicated myself to spreading the word that urban violence could be controlled and to doing further research about that goal. I went to work at the Pan American Health Organization in Washington, D.C., was instrumental in actions that created the Inter-American Coalition for the Prevention of Violence and helped to garner approval of a loan from the Inter-American Development Bank to Cali, Medellín and Bogotá for deterring violence. After three years, I returned to Cali and helped to launch VallenPaz, an organization devoted to creating economic programs in rural southwestern Colombia as an alternative to the lure of money from guerrillas and illicit drug crops.

Years later, however, I found that there is no lifelong immunity to politics. I ran again for mayor of Cali.

When I took office on January 1, 2012, I found a different city. Cali had grown from 1.8 million inhabitants in 1994 to 2.4 mil-

MOST VIOLENT NATIONS: Central and South America top the charts in premature death and disability caused by violence between individuals, such as shooting or stabbing. In most countries worldwide, less than 3 percent of the population (*dark and medium blue*) suffers this fate, but in parts of the Americas, the figure rises higher, as in Colombia (9.3 percent) and El Salvador (13.3 percent). Data-driven steps to reduce violence in Colombian cities are succeeding and starting to be used elsewhere.



*Disability-adjusted life years: years of life lost to premature death or spent in ill health or disability.

SOURCE: GLOBAL HEALTH DATA EXCHANGE, INSTITUTE FOR HEALTH METRICS AND EVALUATION, UNIVERSITY OF WASHINGTON

Map by Terra Carta

lion. Most of the additional people were migrants, primarily from Colombia's Pacific coast and neighboring rural areas. After years of incompetent administrations and one mayor ousted from office, collective self-esteem was low, and unemployment was up from 6.9 percent in 1994 to 13 percent in 2013. Although the large Colombian drug cartels were dismantled in the 1990s, they had fragmented into smaller cartels that worked rather independently in the nation's cities, particularly in Medellín and Cali. Drug dealing was still present, and new forms of crime had emerged, such as small "vaccine" payments required by gangs to protect local businesses and war over the territorial control of drug distribution and selling within cities.

The good news was that the Colombian police had become professional and trustworthy. The national homicide rate had dropped from 79 in 1991 to 36 in 2011. Yet Cali's homicide rate was around 80, compared with 22 in Bogotá and 70 in Medellín.

I immediately reinstated the weekly security council meetings. Soon our data analyses showed that the proportion of homicides resulting from interpersonal conflict such as quarrels and alcohol-related brawls had diminished compared with the period of 1992 to 1994. But killings that we classified as organized crime—those that were premeditated and involved sophisticated weapons such as machine guns—accounted for 67 percent of violent deaths in 2012. Data suggested that organized crime was playing a bigger role. The data also showed that social inequalities had gotten worse since my earlier term.

We presented our data to the national government and suggested it create specialized groups of criminal investigators, police and prosecutors to dismantle criminal bands. My administration also began a massive social investment plan in 11 districts that were home to a total of 800,000 people, 26 percent of them living in poverty and another 6.5 percent in extreme poverty.

The plan that resulted, called Territories of Inclusion and Opportunities, is still in effect today. It applies a geographical approach to fighting poverty, focusing interventions in impoverished areas and encouraging local residents to play big roles. Local and national officials work on raising incomes, extending school schedules, promoting cultural activities and sports, and improving housing, health facilities and public education. We also teach parenting skills and peaceful conflict resolution.

Together with the effort from the national government to fight organized crime, our interventions again reduced violence. Cali's homicide rate of 83 in 2012 dropped to 62 in 2014. This pattern has continued; the number of homicides in the first trimester of 2015 is less than in the same period in any of the past 12 years.

All these coordinated police and social actions help the crime interventions. A good example of the strategy is Comuna 6, a political district of Cali where 212,000 residents, most of whom are middle-income, live. We energetically implemented the coordinated police and social interventions, and homicides went down 44 percent within a year's time, from 160 in 2013 to 89 in 2014.

The epidemiological approach to reducing violence is passing the test in other cities in Colombia and across the Americas. Crime observatories—the evolution of our regular security council meetings—are essential to the approach. The Inter-American Development Bank, the U.S. Agency for International Development and the World Bank, among others, now recommend that cities or states create the observatories when seeking financial support for violence-prevention programs. Today four national and numerous municipal-level observatories are meeting systematically in 26 countries and cities in the Americas.

A study published in the *International Journal of Injury Control and Safety Promotion* found that homicides were significantly reduced in 22 Colombian cities in the three-year period after the observatories were implemented. Studies directly comparing cities in different countries are difficult, however, because countries have diverse definitions of crimes and varying criteria for collecting information. To improve the situation, the Inter-American Development Bank is supporting a project to standardize violence indicators across the Americas.

POLITICAL WILL IS THE TOP PRIORITY

USING AN EPIDEMIOLOGICAL STRATEGY to help solve a social issue may seem straightforward, but it is not. The first lesson I can espouse is that such a move takes strong political will because the strategy frequently requires public officers to do things they would rather not do, such as making necessary but unpopular decisions to close bars or ban firearms. Making crime data public can also be uncomfortable, but it is essential, just as economists releasing unemployment and gross domestic product numbers is essential to formulating economic strategy. Data on social issues such as violence and education are now published periodically for various Colombian cities by nonprofit groups called Bogotá How Are We Doing, Cali How Are We Doing, and so on. The information makes public officials and mayors accountable in their communities.

The second lesson is that there is no one-size-fits-all approach in applying epidemiological methods to social issues because cities and countries have different risk factors. Data-driven observation is needed in each context to guide public officials.

The process also requires perseverance and patience. Certain risk factors can be controlled rapidly—for example, by banning firearms or restricting bar hours—but other measures, such as improving the reach of police and judiciary services, take longer. Steps such as correcting social inequalities or establishing healthy child-rearing practices need not only time and patience but also considerable resources.

Urban violence is socially regressive because it mostly affects the poor, and fighting crime devours a portion of the public budget, which could instead be invested to eradicate poverty. Violence prevention must therefore be a priority for humanity. SA

MORE TO EXPLORE

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