Original Research

Violence in Colombia and Mexico: trend and impact on life expectancy of homicide mortality between 1998 and 2015

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ARTICLE INFO

ABSTRACT

Objectives: Colombia is considered one of the most violent countries in the world even though homicide mortality has decreased since 2002. Mexico's homicide rate has tripled since 2008, after a period of decreasing mortality; this fact has been compared with Colombia in the 1990s and defined as a 'Colombianization' of violence in Mexico. We analyzed and compared the trend and impact of homicide mortality in Colombia and Mexico between 1998 and 2015.
Study design: Cross-sectional descriptive study.
Methods: We calculated the standardized mortality rates and the years of life lost using data from the National Institute of Statistics and Geography in Mexico and the National Management Department of Statistics in Colombia. We used the joinpoint regression analysis to identify significant changes in the mortality trend.
Results: During the 1990s, Colombia reached the highest homicide mortality rates in the world, but these rates have since decreased significantly. In Mexico, homicide mortality had a decreasing trend from 1998 to 2007; however, since 2008, the rate grew significantly, and although mortality tended to decrease after reaching its peak in 2011, a slight upturn was observed in 2015.
Conclusions: We found that the trend in mortality in both countries has had certain similarities, such as the increase in mortality after the implementation of antidrug policies and the subsequent decrease; however, the political processes, the level of mortality reached, its impact on life expectancy, and its distribution by gender are dissimilar. We consider speaking of a 'Colombianization' of violence in Mexico to be inaccurate.

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Introduction

Violence is one of the leading public health issues worldwide. It is a complex topic given its characteristics and the consequences it has on the society.[1] Violence manifests itself in many different ways and finds its maximum expression in homicide, resulting in death of the victim and a huge impact on the society.[2] This reflects serious problems existing in any society such as inequality, impunity, corruption, or the presence of organized crime.

In 2000, 520,000 homicides were estimated worldwide, with a mortality rate of 8.8 homicides per 100,000 people.[3] In 2012, the estimated total homicide count was 437,000 (a rate of 6.2 per 100,000 people); 79% of the victims were men (leading to a male rate of 9.9 and a female rate of 2.7 per 100,000 people); and the highest mortality rates occur in the age range of 15—29 years, followed by those aged 30—49 years.[4]

Latin America has the highest homicide mortality rate in the world, where it has reached 'epidemic' levels;[5] more than one-third of the world's homicides occur in this region.[6] The distribution of the phenomenon is heterogeneous. There are countries with relatively low rates such as Argentina, Chile, Costa Rica, Cuba, and Uruguay (with rates of under 10 homicides per 100,000 population), whereas others have high and very high levels of homicide mortality such as Brazil, Mexico, Colombia, El Salvador, Honduras, and Venezuela.[7]

During the 1990s, Colombia was one of the most violent countries in the world, with rates of more than 50 homicides per 100,000 population (reaching a maximum rate of 81.6 per 100,000 population in 1999) but with a sharp decline beginning in 2002.[8] During the same period, Mexico had a lower homicide rate (fewer than 13 homicides per 100,000 population).[8] However, since 2008, as a result of the government's antidrug campaign known as 'Mexico's War on Drugs',[9] the homicide rate has tripled, peaking in 2011, placing it among the most violent countries in the region. This fact has been compared with a case in Colombia in the 1990s[10] and has been defined as a 'Colombianization' of violence in Mexico.[11] 'Colombianization' refers to the empowerment of drug trafficking organizations, with an increase of violence to the levels seen in Colombia during the 1990s, resulting in a permanent state of violent crime.[12] In light of this, the question arises whether such a comparison is correct or, in contrast, whether both processes are dissimilar, regarding its trend or impact on life expectancy on different age groups or by gender. Therefore, this study sought to analyze and compare the trend and impact of homicide mortality in Colombia and Mexico between 1998 and 2015, at a national scale, by gender and age groups. This comparison is relevant because the antidrug policies implemented in Colombia are being applied in Mexico because of the perception that Mexico is undergoing a 'Colombianization'.[12]

Methods

We conducted a cross-sectional study using data from 1998 to 2015 from the mortality vital statistics of the National Institute of Statistics and Geography in Mexico and the National Management Department of Statistics in Colombia. We adopted the definition of homicide from the International Classification of Diseases (ICD-10), in which it appears under the heading 'Assault' (codes X85-Y09; Y87.1).

We calculated the national standardized homicide mortality rates, using the direct method, by gender, taking the population of Mexico in 2014 as a standard. To estimate how many years, on average, both populations lost due to homicides in people younger than 85 years, we calculated the years of life lost (YLL) proposed by Arriaga, using a null-mortality assumption.[13] This technique is one of the primary tools to measure changes in the levels of mortality and mortality by cause.[13] It also allows us to associate mortality by specific causes of death with changes in life expectancy, and we can account for the impact of homicide mortality on the health of the population.[14]

We estimated the standardized mortality rate trends by sex and country and the YLL trends by country using a joinpoint regression analysis.[15] We used this analysis to detect significant changes in the temporal trend. The advantages of this approach are that it identifies changes in the trend and it estimates the magnitude of the increase (or decrease) in each interval by estimating the annual percent change (APC).[15] We used the Surveillance, Epidemiology, and End Results statistical software (Joinpoint Regression Program, version 3.5.1).

We excluded homicides where the record did not specify the sex (6238 cases in Colombia and 4517 in Mexico). We conducted a proration to distribute deaths of non-specified ages among the rest of the age groups. To calculate the YLL, we excluded homicides registered of people older than 85 years (29,740 in Colombia and 30,809 in Mexico). We ruled out 2.4% of the total homicides registered in Colombia and 2.7% in Mexico. Ethical approval was not required because this study uses data from secondary sources that do not contain any individual identifiers. All databases used in this study are publicly accessible.

Results

In Colombia, homicides represented 14.1% of the total registered deaths in 1998 (a maximum of 16.5% in 2002); in 2015, they had decreased to 5.6%.[16] Between 1998 and 2002, the standardized homicide mortality rate increased 4.9% annually (non-significant) from 66.2 to 80 homicides per 100,000 people. From 2002, the homicide rate decreased to 25.8 per 100,000 people in 2015, with a trend divided into three periods: (a) high decrease (2002—2005 with an 18.3% annual decrease); (b) stability (2005—2010 with an APC of 1.3%); and (c) new decline (2010—2015 with an APC of −9.1%) (Fig. 1).

In Colombia, homicide mortality in men was higher than in women. The male/female ratio decreased from 13.2 to 10.2 male homicides for every female homicide. Between 1998 and 2002, male rates increased from 123.9 to 149.4 homicides per 100,000 population (equal to 20.6%) (Fig. 2); female rates also increased, but to a greater extent (29.3%), from 9.5 to 12.3 homicides per 100,000 population. After 2002, homicide mortality decreased in both genders, reaching its minimum value in 2015 with rates of 47.1 homicides in men and 4.4 in women per 100,000 population (a change of 68.5% and 64.6%, respectively, compared with 2002).