

Death from external causes in infants in Colombia 2005-2013

Muertes de causa externa en menores de cinco años en Colombia 2005-2013

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Abstract

Latin America has shown a significant reduction in infant mortality in recent years. The objective of this study was to analyze official data for children under five years of age in Colombia, emphasizing external causes of death, which have been less studied. **Patients and Method:** Descriptive cross-sectional design using secondary information from death records reported by the National Administrative Department of Statistics (DANE) and information dynamic tables of vital statistics, taken from the official information system of the Ministry of Health and Social Protection (SISPRO), between 2005 and 2013 were reviewed. The information was organized in tables for descriptive analysis of variables such as age, sex, and specific cause of death, by departments. **Results:** In this period 106,339 children under 5 years died; 85,897 of them (81%) in the first year of life. The number of deaths decreased from 14,266 in 2005, to 9,499 in 2013. The main external cause of death was drowning, responsible for 1749 deaths, followed by traffic accidents, 1,282. Homicides were responsible for 692 deaths. In all the causes of death analyzed there was a decline over the decade. **Discussion:** Colombia is accomplishing the fourth millennium goal, “reduce the mortality of children under 5 years.” Progress has been made in deaths from external causes, but there is still some way to go.

Keywords:

Cause of Death;
Colombia;
Infant Mortality;
Millennium
Development Goals;
Vital Statistics

Introduction

Reducing child mortality is part of the Millennium Development Goals, set in 2000¹, and is one of the most difficult aspects to accomplish in the public health system in Colombia. According to official statistics, mortality rate in children younger than 5 years old has been reduced from 24.6 to 14.1 deaths per 1,000 live births between 2000 and 2013². Although many countries have made significant improvement, few are on the way to achieve the established goals. Many interventions have focused on priority causes, such as infectious and nutritional diseases⁴⁻⁶, leaving aside deaths from external causes, despite being responsible for about one out of every twenty deaths in children under 5 years of age worldwide, which should be totally preventable^{8,9}.

Since its origins back in 1953, the National Administrative Department of Statistics (DANE by its acronym in Spanish) has been showing a progressive decrease in the number of deaths occurring in children under five years of age¹⁰, which is a fact that has been observed in all Latin American countries^{11,12}.

Since 2005, all the general information on deaths, by gender, age and cause of death, has been presented in the DANE pages and has been gathered for analysis in the vital statistics information tables of SISPRO, the Ministry's official Information System for Health and Social Protection of Colombia¹³. This report presents a secondary analysis of the data for the population under five years old, with emphasis on the group of deaths due to external causes, located in different regions of Colombia, during the years 2005 to 2013.

Patients and Method

All the information derived from death certificates is available both on the DANE portal and on the SISPRO* portal. This information can be organized using Excel tables, as well as using several filters. In this case, we grouped by different ages, which were grouped year by year and by department. From this pivotal table, the information for all patients under 5 years of age was extracted, making tables gathering information of everyone who met the criteria of every single year, from 2005 to 2013 (the original idea was to include 2014, but results were incomplete for this year). Then, a causal analysis was made, grouping them according to causal "groups", into the

three major disease categories of the Global Burden of Disease (GBD) study, and the Institute for Health Metrics and Evaluation (IHME)¹⁴. This classification is defined as: Group 1: infectious diseases, maternal and neonatal conditions, and nutritional deficiencies; Group 2: chronic noncommunicable diseases; and Group 3: external causes. External causes include traffic accidents, self-inflicted injuries, violence, armed conflict, and domestic accidents. For some causes of interest, individual tables were created, following the ICD-10 disease classification. Emphasis was placed on those causes of death considered preventable. This analysis was repeated for each department (region). From this information, descriptive statistical analyzes were performed to determine the progression of the change, if any, over the 9-year analysis. Within this group, children who died in traffic accidents (V80-89-land transport accidents), or who passed away drowned (W65-74-accidental drowning and submersion), burned (X76, X97, Y26 - exposure to smoke, fire and flames) and exposed to harmful substances (X40-49) or violent death (X85-Y09 - assaults, homicides), were included.

Results

During this period, 106,339 children under 5 years of age died in Colombia; from these, 85,897 (81%) died during their first year of life. There was a progressive decrease in the number of deaths, from 14,265 children under 5 years of age who died in 2005 to 9,499 in 2013 (equivalent to a 33% reduction in the annual number of children who died). The decrease in the death rate would be 19.4 to 14.1 for every 1,000 live births (a considerable decrease of 27%). This proportion of the reduction of deceased children was higher in Boyacá (from 406 children in 2005 to 154 in 2013, a 62% decrease), followed by Cauca (452 in 2005 to 229 in 2013, a 49% reduction), and Tolima (404 in 2005 to 218 in 2013, a decrease of 46%). Other regions that showed a reduction above 40% were, in decreasing order, Norte de Santander, Antioquia, Quindío, Huila, Cundinamarca and Risaralda.

There are significant disparities among regions. In the Andean region, the number of children that died decreased from 9,682 in 2005 to 5,990 in 2013 (a 38% of decrease). The Amazonia and Orinoquía regions together went from 789 children who died in 2005 to 531 in 2013 (reduction of 33%); while the Caribbean region showed the lowest decrease in its mortality: from 3,794 children in 2005, to 2,778 in 2013 (a reduction of 21.5%) (Table 1).

There was a clear tendency to reduce the number of children who died in all regions of Colombia, with

*NT: SISPRO is an acronym in Spanish for 'Comprehensive Social Protection System', or CSPA in English. It is decided to keep its Spanish form, due to the context in which the term is applied.

the exception of Amazonas, Guainía, La Guajira, San Andrés, and Vaupés (where we even found an increase). In many cases, it is not possible to determine the specific cause of death from death certificates, since the diagnosis is often not precise or detailed. Thus, during the period of this study, 7,044 children died from “other unspecified bacterial diseases”; 6,702 from “general signs and symptoms”; 5,836 from “other disorders originated in the perinatal period”; 877 from

“other illness and unspecified causes of mortality”; 4,996 from “cardiac arrest” and another 963 from “respiratory arrest”. This is a matter of concern, as it could affect the validity of our analyzes of deaths from external causes. Such diagnoses as “asphyxia” (1,894 deaths), “head injuries”, in which it is not specified whether it was an assault or accident (726 deaths); as well as “traumatic shock” (1,270 deaths) are also very worrisome.

Table 1. Number of deaths in children under 5 years of age by department, in the period 2005-2013

	2005	2006	2007	2008	2009	2010	2011	2012	2013
Amazonas	50	30	55	39	39	42	25	34	42
Antioquia	1630	1586	1542	1505	1223	1129	985	1001	897
Arauca	105	56	46	46	41	56	38	40	30
Atlántico	1095	1150	1008	856	836	664	701	685	816
Bogotá, D.C.	2503	2366	2365	2296	2026	1927	1806	1824	1618
Bolívar	693	533	432	553	526	413	448	514	482
Boyacá	406	349	315	307	237	236	192	188	154
Caldas	242	235	235	194	162	161	117	125	161
Caquetá	187	140	129	216	165	121	125	99	99
Casanare	55	58	50	60	42	55	42	39	27
Cauca	452	377	324	277	303	258	241	268	229
Cesar	383	412	467	454	398	333	299	335	313
Chocó	203	207	195	205	220	190	134	160	135
Córdoba	652	549	570	616	677	493	561	584	584
Cundinamarca	482	436	403	401	357	317	357	348	288
Guainía	18	14	22	19	20	21	16	14	17
Guaviare	28	14	26	26	12	15	15	8	12
Huila	464	510	453	387	360	296	280	310	274
La Guajira	283	283	272	237	283	262	292	300	275
Magdalena	475	493	547	514	482	410	392	348	338
Meta	320	324	314	319	317	272	293	257	268
Nariño	354	502	451	422	428	328	367	297	302
Norte de Santander	425	384	434	460	323	304	292	267	230
Putumayo	76	61	58	44	47	50	48	33	36
Quindío	115	126	114	101	116	81	79	74	65
Risaralda	265	218	242	207	215	205	175	183	159
San Andrés	9	11	9	11	9	17	8	17	11
Santander	524	507	605	502	508	473	421	426	451
Sucre	204	251	228	205	181	139	135	169	159
Tolima	404	369	357	333	291	289	253	261	218
Valle del Cauca	1137	1167	1055	1069	967	903	857	849	773
Vaupés	7	21	20	30	28	31	32	19	24
Vichada	19	21	26	24	28	25	16	10	12
Total	14265	13760	13369	12935	11867	10516	10042	10086	9499

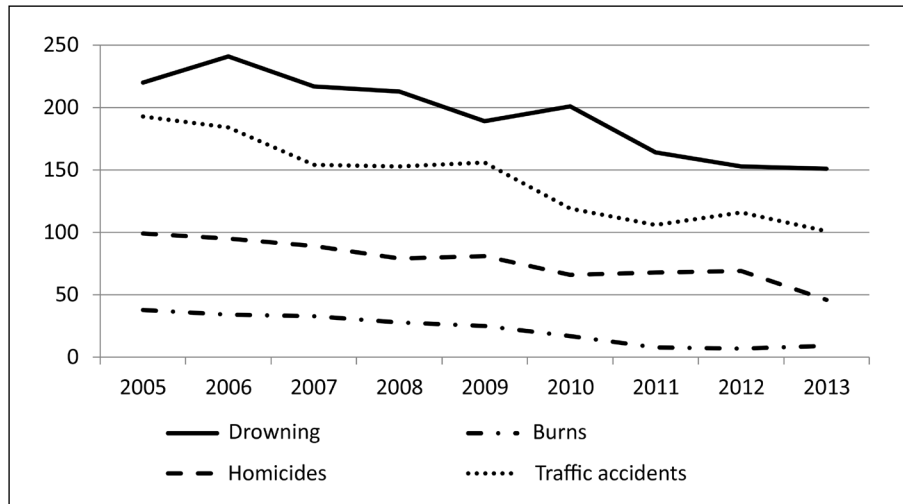


Figure 1. Children under 5 years of age dieing from external causes, in the period 2005-2013.

Those five external causes of death that were analyzed represented 4,043 children who died, equivalent to 3.8% of all deaths in this age group; 2,381 of these deaths (59%) occurred in males. From these, the main one is drowning by submersion. In this 9-year period, 1,749 children died (males 1,096, 63%), which is equivalent to an average of almost 4 per week. A decrease in the number of deaths is observed here: from 220 in 2005 and 241 in 2006, to 152 in 2012 and 151 in 2013 (Figure 1). This reduction is similar in deaths from traffic accidents, which went from 193 in 2005 to 184 in 2006, to 116 in 2012 and 101 in 2013. These accidents were the cause of death for 1,282 children (males 741; 58%) during this 9-year period. The third main cause of death are homicides, responsible for 328 girls and 364 boys (total 692), during this period. As shown in Figure 1, there is also a reduction, from 99 deaths in 2005 to 46 in 2013. Children who died from burns, who were 199 (males 116; 58%) showed the greatest reduction as well, from 38, 34 and 33 deaths in 2005, 2006 and 2007, respectively, these were reduced to 8 in 2011, 7 in 2012, and 9 in 2013.

Discussion and conclusions

Death certificates, as sources of information, have several limitations. The first is coverage, since all deaths are not necessarily recorded. According to a study made in 2000, the coverage of death certificates in Colombia was close to 80%, and the lack of registries affected mainly neonates, and the more remote rural areas.

Also, this lack of information affects some causes of death above others. This may lead to bias (due to underestimation), however, it is feasible that deaths from

external causes (due to their legal implications, at least more than deaths from other causes) suffer less underreporting. It is important that doctors are aware of the major topic that means to create a death record, which is often seen, not as a source of vital information, but as a simple bureaucratic process.

The first interesting finding of this study is the progressive decrease of all causes of mortality, more noticeable in the Central region of Colombia than in the Caribbean region. This reduction in mortality is also observed in deaths from external causes, deaths that, although representing a little less than 4%, can produce traumatic consequences to the family of the deceased. There is still much that can be done in this area.

Several countries have designed strategies to reduce drowning deaths¹⁵, traffic accidents¹⁶ and intoxications¹⁷. Regarding Colombia, the restriction on the use of gunpowder¹⁸, as well as the extension of the use of household gas (in replacement of liquid hydrocarbon stoves, so common a couple of decades ago), must have contributed to the reduction of child mortality, especially those who died by fire¹⁹. Although a huge progress has been made at the national level, not all regions of this country have benefited equitably. As in other socio-economic indicators, the Caribbean region is less favored. Although the inequality of these death rates was not analyzed in this study, it would be interesting to analyze the relationship of these external causes, with poverty or the educational level of parents.

We could conclude, then, that the challenges imposed by social development require more work in perinatal deaths, associated with poor obstetric care, and with infectious and nutritional diseases. Deaths from external causes should all be preventable and require interventions from different sectors require intersectoral interventions as they should be avoidable.

Ethical Responsibilities

Human Beings and animals protection: Disclosure the authors state that the procedures were followed according to the Declaration of Helsinki and the World Medical Association regarding human experimentation developed for the medical community.

Data confidentiality: The authors state that they have followed the protocols of their Center and Local regulations on the publication of patient data.

Rights to privacy and informed consent: The authors have obtained the informed consent of the

patients and/or subjects referred to in the article. This document is in the possession of the correspondence author.

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Conflicts of Interest

Authors declare no conflict of interest regarding the present study.

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