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The occurrence of external causes in childhood in emergency care: epidemiological aspects, Brazil, 2014

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Abstract Objective: *To describe emergency care for external causes in childhood, age group 0-9 years, in Brazilian capitals, collected from the Violence and Accident Surveillance System (VIVA) Survey in 2014.* Methods: *To review data from the VIVA survey conducted in public emergency services in 24 Brazilian capitals. Variables analyzed were gender, age group (0-1 years, 2-5 years and 6-9 years), race/skin color, type of events and injuries, aggressors and other.* Results: *Eight thousand five hundred eighty-eight children received care, of which 8,164 (95%) were victims of accidents and 424 (5%) of violence. Boys suffered more accidents, most events occurred at home (65%) and discharge was the most frequent outcome. Falls were the most frequent accidents, followed by other accidents, road injury and burns. Neglect prevailed among the types of violence, followed by physical violence. The perpetrator was a child's relative in 72% of the cases, and women were the most frequent aggressors for children under 1 year, and men for children aged 6 to 9 years.* Conclusion: *Childhood accidents occurred mainly at home, and falls were the most frequent events. Family members and acquaintances perpetrated violence against children. Data point to the implementation of public prevention and child protection policies.*

Key words *Childhood, Injuries, External causes, Emergency care, Violence*

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Introduction

External causes in childhood are a public health problem worldwide and the leading cause of death in children, accounting for about 40% of all deaths in this group. Some 950,000 children and adolescents' deaths by accidents or violence are reported in the world each year, in addition to millions of sequels arising from non-fatal injuries[1,2].

The main causes of disability-adjusted life years (DALYs) arise from external causes in children aged 0-14 years, including road injury[1]. These events are distributed unequally and focus low-income countries and low socio-economic level populations[1,2].

Violence against children occurs in various forms, whether physical violence, neglect, sexual and others, with serious consequences to their growth and development[3,4]. Violence against children is recognized by the World Health Organization as a global issue, affecting millions of children, family members and communities every year[2].

In 2015, the UN noted overall progress in child health in the Millennium Development Goals (MDGs) Report, however, there are still gaps, which justifies maintaining these indicators in the Sustainable Development agenda, indicating the much that remains to be done in the prevention of violence against children and women[5,6].

In the world and in Brazil, the large sub-notification of these events, the lack of uniformity and integration of records is still widely recognized and it is still difficult to grasp the full extent of the problem, which affects victim protection actions[7-9].

No violence against children is justifiable and all forms can be prevented and addressed[1,2]. According to the Children and Adolescents Statute, no child or adolescent should be subjected to any form of neglect, discrimination, exploitation, violence, cruelty and oppression, and the right to life and health protection should be ensured[10]. In 2013, Brazil recorded 3,745 deaths of children aged 0-9 years by external causes, which was the 3rd cause of death after perinatal causes and malformations[11]. About a third of these deaths are related to road injury, drownings, breathing other risks, aggressions and falls[11,12].

Accidents and violence in childhood can result in irreparable emotional, physical and social damage; they definitely mark the lives of children, families and society. The preventability of these events is clear and should involve families, schools, society and governments. All sectors of society share the responsibility of condemning and preventing accidents and violence against children[1,2,5].

The Ministry of Health established in 2006 the Violence and Accident Surveillance System (VIVA), which has a component held by periodic surveys in urgent and emergency care services of the healthcare network of the Unified Health System (SUS), which are external causes' sentinels. External causes (accidents and violence) are monitored, allowing for continued surveillance of distribution, size and trend of these diseases and their risk and protection factors, including information on vulnerable populations such as children and the elderly. VIVA has supported the planning at the three management levels of the SUS and the definition of appropriate prevention and health promotion interventions[13].

This paper will describe emergency care relating to external causes in childhood, in the 0-9 years age group, in the Brazilian capitals, collected from the Violence and Accident Surveillance System (VIVA) in 2014.

Methods

This is a cross-sectional study conducted in 2014 in 86 urgent and emergency care services sentinels of the SUS located in the Federal District and 24 Brazilian capitals. State capitals Florianópolis/SC and Cuiabá/MT failed to run the survey due to local issues related to management and technical and operational aspects. The criteria of inclusion of establishments in the sample used emergency care references included in the National Register of Health Facilities (CNES). Emergency services were analyzed for the external causes-related care demand informed in the Hospital Information System of the Unified Health System (SIH/SUS) and the VIVA Survey (for services participating in one or more previous study editions: 2006, 2007, 2009 and 2011)[13]. The inclusion of selected services was validated by coordinators of the Noncommunicable Diseases and Illnesses Surveillance Department (DANT) of state and municipal health secretariats participating in the research.

These services are external causes' sentinels, since they are the main gateways to violence and accidents in the municipalities. The original survey included the care provided in urgent and emergency care services located in the Federal

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District, in 24 state capitals and in 11 selected municipalities. This study only analyzed occurrences of the federal capitals. A 30-day collection period from September to November 2014, divided into 12-hour shifts, totaling 60 possible collection shifts was considered. The shift was the primary sampling unit (PSU). Considering the cluster sampling, a single-stage random drawing of shifts, stratified by urgent health services establishments was carried out. All care services provided due to external causes in the drawn shift were sampled and interviewed. A standardized form was used in all of the 86 Urgent / Emergency care services selected for study in the 24 state capitals.

The Health Surveillance Secretariat held a centralized training in Brasilia prior to the study to standardize collection, define and standardize records and procedures. The qualified teams have replicated training in their own municipalities, ensuring standardization of procedures. Municipalities received financial resources for logistical support in the collection, training, records, typing and other operating procedures.

All external causes' victims seeking care in selected urgent and emergency care services and who agreed to participate were eligible for interview. Sample size was at least 2,000 attendances for external causes' care in each capital and the Federal District, assuming a coefficient of variation of less than 30% and standard error below 3.

Data were collected through a standardized form used in previous VIVA studies and adapted for this VIVA edition[14]. All users receiving care due to external causes were interviewed by trained data collectors. With regard to those who were unable to respond due to injuries sustained, the accompanying person was interviewed and medical records data were collected. The current study examined the 2014 VIVA Survey 2014 data, and this investigation was approved by the National Research Ethics Commission (CONEP), the Ministry of Health. Data collection was performed following consent of victims or their legal guardians or accompanying persons, when under 18 or if they wereunconscious victims.

Care was classified into two groups: violence and accidents. Violence was defined as "the use of force against a group or community that results or has any chance of resulting in injury, death, psychological harm, developmental disability or deprivation"[2]. Accident was defined as "unintentional and avoidable event causing physical and emotional injuries, at home or any social context such as work, school, sports and leisure."We considered the definitions of the 10th revision of the International Classification of Diseases and Related Health Problems (ICD-10) related to Chapter XX-External causes of morbidity and mortality. Among the events of accidental causes included are Transport Accidents (V01-V99), Falls (W00-W19), Burns (W85-W99, X00-X19) and other accidental events, such as cuts with sharp piercing objects, falling objects, accidental poisoning, suffocation, drowning and others. Violent events were classified as Assault (X85-Y09), Abuse (Y05-Y07),Legal Intervention (Y35), Self-Harm / Suicide Attempt (X60-X84).

For this study, we considered individual features, occurrence outcome and accident and violence characteristics. The following variables were analyzed: age group (0-1 years, 2-5 years and 6-9 years), race/skin color, means of transportation used to get to emergency care services, place of occurrence, type of injury, injured body part, shift and day of care, development in emergency.

Regarding accidents, type of accident was described according to age (transportation, falls, burns, other), type of victim (passenger, driver, pedestrian), victim's means of transportation (walking, car, motorcycle, bicycle), fall type (same level, bed, furniture, tree, hole, other), type of burn (fire, flame, hot substance, hot object, other) and other accidents. As for violence, the type of violence suffered was described by age group (self-inflicted injury, aggression), nature of violence/aggression (physical, sexual, psychological, neglect, other), means of aggression (physical force, firearm, blunt object, sharp object, other), whether the aggressor was a family member (yes or no), gender of aggressor.

All children under 10 years treated in urgent and emergency referral services of the 24 state capitals and the Federal District were analyzed, comparing the characteristics of accidents and violence victims, stratified by age group (0-1 year, 2-5 years and 6-9 years). The methodological option to compare events by age group was chosen based on evidence that distribution is differentiated according to the age group, both regarding accidents and violence[14], making it important to understand this distribution to support public policies.

The null hypothesis of independence between qualitative variables was assessed using the chi-square test, with 5% significance level. We also used logistic regression and calculated crude OR and adjusted for age, sex and skin color to compare the associated factors of violence and

accidents.We used Stata's "SVY" module, version 11 to obtain unbiased estimates when data derived from complex sample designs.

Results

From a total of 55,950 in the VIVA survey, there were 8,588 emergency care attendances among children in the age group 0-9 years, and 8,164 (95%) were victims of accidents and 424 (5%) of violence. Among children, 21.4% were younger than 1 year of age, 42% fell in the 2-5 years age group and 36.6% in the 6-9 years age group; worth highlighting is the occurrence of accidents in children aged 2 to 5 years and violence in children aged 0 to 5 years ($p < 0.001$). As for race/skin color, 62.8% were black (black/brown), 35.0% white; most cases occurred at home (65%) and were predominantly domestic violence (72.4%) ($p<0.001$). Bruises were the most frequent injuries (31.5%), followed by cuts (29.7%). Head and neck (45.6%) were the most affected body parts, especially in cases of violence ($p < 0.001$). Private car transportation to the hospital was the most common means of transport (59.5%). As to the time and period, attendances during daytime and during the week prevailed, with no statistical difference between accidents and violence. Discharge was the most common outcome of care provided (81.7%) (Table 1).

In the analysis by age group, boys suffered more injuries in all age groups (60.3%), predominantly between the age of 6 and 9 ($p < 0.006$). In the cases of violence, boys were also more frequent victims. Children of black race/skin color (black/brown) prevailed among those involved in accidents, especially those between the age of 6 and 9 (66.8%; $p < 0.001$). P value was not calculated for violence due the small number of observations. Events were more frequent at home, both in accidents (64.4%) and violence (72.4%), with higher incidence of accidents among children aged 0 to 1 ($p < 0.001$). Among accidents, bruises were the most common injuries in children aged 6 to 9. Cuts were the most common attendances for injuries due to violence. Head was the most affected body part in accidents and violence, particularly in children aged 0 to 1 year (62.7% and 59.8%, respectively). Discharge was the most common outcome in emergency care development during the first 24 hours, with no significant differences by age group (Table 2).

In the comparative analysis of emergency attendances among children victims of violence/accidents and associated factors, calculating the adjusted OR, there were differences according to age: children aged 6 to 9 years suffered more accidents than violence (OR at 1.71 – CI 95 % 1.34-2.20); black or mulatto children suffered more accidents violence (OR at 1.27 – CI 95% 1.13-1.44), and yellow and brown (OR at 1.05 – CI 95% 1.02 to 1.08), with odds lower for white children. As for the place of occurrence, more accidents occurred on public roads than violence (OR at 1.54 – CI 95% 1.04 to 2.27). The nature of the most frequent injury in accidents compared to violence was concussion (OR to 1.60 – CI 95% 1.17 to 2.21), and the injured body part, the lower limbs (Table 3).

Falls (52.4%) were the most frequent accidents, followed by other accidents (36%), road injury (9.4%) and burns (2.2%). Falls predominated in children under 1 year of age (63.1%; $p < 0.001$), among which from bed / furniture (42.5%) and same-level (31.7%). However, the latter was more common in children aged 6-9 years (60.2%) ($p< 0.001$).

The second most frequent events were other accidents, highlighting collision with object/person in children aged 6-9 years (32.1%) and 2-5 years (18.9%) ($p<0.001$), as well as the sprain/crushing (15%) and accidents with animals (13%). Transport accidents predominated in children aged 6-9 years (12.1%); passengers were the most frequent type of victims (40.6%), especially among children aged 0-1 years (66%). The victim's predominant means of transportation was bicycle (41.5%). The bicycle – non-motorized bicycles, tricycles and similar (41.5%) – was the victim's most frequent means among children aged 6-9 years (45.8%) ($p < 0.001$). Burns (2.2%) were more common in the 0-1 year group (4.8%), and those caused by hot substances were the most frequent in all age groups (72.8%) (Table 4).

As for violence, neglect was more frequent (63.2%), followed by physical abuse (33.4%). Sexual violence occurred in 3.1% of children. A child's family member was the likely violence perpetrator in 72% of cases; women were the most common perpetrators for children under 1 year, and man for children aged 6 to 9 years ($p = 0.040$), as shown in Table 5.

Discussion

Accidents and violence in childhood entail social, economic and emotional costs and are re-

Table 1. Emergency care for accidents and violence among children, by type of event - 24 capitals* and the Federal District, Brazil, from September to October, 2014.

Characteristics	Type of event[a]			
	Accidents (n = 8,164) %	Violence (n = 424) %	Total (n = 8,588) %	P value[b]
Sociodemographic				
Gender				0.941
Male	60.3	60.6	60.4	
Female	39.7	39.4	39.7	
Age group (years)				0.000
0 to 1	20.3	37.5	21.4	
2 to 5	42.4	37.2	42.0	
6 to 9	37.4	25.3	36.6	
Race/skin color				0.000
White	34.2	47.4	35.0	
Black/brown	63.6	50.5	62.8	
Yellow / indigenous	2.2	2.1	2.2	
Has some kind of disability[c]				**
Yes	1.4	1.0	1.3	
No	98.6	99.0	98.7	
Population in vulnerable situation[d]				**
Yes	0.9	0.5	0.9	
No	99.1	99.5	99.1	
Has health plan				0.163
Yes	7.5	5.2	7.3	
No	92.5	94.8	92.7	
Of the event				
Location of the event				0.001
Home[e]	64.4	72.4	65.0	
Public road	15.9	9.4	15.5	
School	11.9	14.3	12.0	
Leisure area	4.6	1.8	4.4	
Other[f]	3.2	2.2	3.2	
Location of the event				0.004
Home	64.4	72.4	65.0	
Away fromhome	35.6	27.6	35.1	
Nature of injury				0.000
No injury	12.5	16.9	12.8	
Contusion / sprain / dislocation	32.2	22.6	31.5	
Cut/laceration	29.8	29.1	29.7	
Fracture / amputation / trauma[g]	18.1	16.5	18.0	
Other[h]	7.4	14.9	7.9	
Body part affected				0.000
Head / neck	45.2	52.3	45.6	
Chest / abdomen / pelvis	3.9	9.0	4.2	
Upper limbs	24.5	21.3	24.2	
Lower limbs	20.7	8.6	19.9	
Multiple organs / parts	5.8	8.9	6.0	

it continues

Table 1. continuation

Characteristics	Type of event[a]			
	Accidents (n = 8,164) %	Violence (n = 424) %	Total (n = 8,588) %	P value[b]
Of care				
Transport to hospital				0.609
Walking / bus / minibus	24.6	27.4	24.8	
Private car	59.5	59.0	59.5	
SAMU / ambulance / rescue	12.7	11.2	12.6	
Other[i]	3.2	2.3	3.1	
Period of care				0.555
Daytime	58.3	56.1	58.2	
Nighttime	41.7	43.9	41.8	
Day of care				0.884
Saturday and Sunday	26.6	26.2	26.6	
Monday through Friday	73.4	73.8	73.4	
Previous care in another facility				0.217
Yes	35.9	31.7	35.6	
No	64.1	68.3	64.4	
Development				**
Discharge	81.7	81.7	81.7	
Hospitalization[j]	12.3	14.0	12.4	
Outpatient referral	5.1	3.1	4.9	
Other[k]	1.0	1.3	1.0	

Source: Ministry of Health, Secretariat of Health Surveillance, Violence and Accident Surveillance System –VIVA, 2014 Survey. * Except Florianópolis/SC and Cuiabá/MT, which have not performed the survey. ** The chi-square test and p value have not been calculated due to the existence of cell with value less than five. [a] The number of attendances for some variables diverged due to missing data (unknown / blank). [b] Chi-square test. [c] Includes physical, mental, visual, hearing impairments and other disabilities / syndromes. [d] Includes gypsy, Quilombola, villager, people living in the streets and other. [e] Includes residence and collective housing. [f] Includes bar or similar, trade / services, industry / construction and other. [g] Includes head trauma, dental trauma and polytrauma. [h] Includes poisoning, burns and other. [i] Includes police car and other. [j] Includes hospitalization and referral to other service. [k] Includes evasion / escape, death and other.

sponsible not only for the majority of deaths, but also non-fatal injuries that have major long-term impact, affecting children, adolescents, families and society[1,2] who have to deal with temporary disabilities, sequels, emotional trauma and suffering resulting from injuries. The consequences of external causes in children, adolescents, families and society must be considered a major public health problem amenable to prevention and protection and dependent on affirmative public policies[10].

VIVA survey has been useful to trace the epidemiological profile of emergency services, identifying characteristics of the victims and likely perpetrators[12,14-16], as well as to provide supplementary information from other information systems, such as SIH and SIM, supporting prevention and health promotion measures.

The current study showed the service profile for external causes in children in urgent and emergency care services, which are mostly cases that evolve toward discharge, evidencing less severe events, which is consistent with other studies. Hospitalizations occurred most often in children under 1 year, possibly due to their higher vulnerability[13,15].

Accidents and violence in childhood include peculiarities in relation to gender, age, place of occurrence and characteristics or circumstances in which they develop[13,17]. Studies have shown that males are more affected by external causes, as was also found in this work. Authors argue that this is due to the fact that education is provided differently according to gender; boys gain freedom earlier and generally engage in more dynamic activities than girls, like playing soccer, ball games,

Table 2. Emergency care for accidents among children by age group - 24 capitals* and the Federal District, Brazil, from September to October, 2014.

Characteristics	Accidents - Age group (years)[a]				
	0 to 1 (n = 1,742) %	2 to 5 (n = 3,494) %	6 to 9 (n = 2,928) %	Total (n = 8,164) %	P value[b]
Sociodemographic					
Gender					0.006
Male	58.2	58.8	63.3	60.3	
Female	41.8	41.2	36.7	39.7	
Race/skin color					0.000
White	40.6	33.8	31.1	34.2	
Black/brown	57.6	63.8	66.8	63.6	
Yellow / indigenous	1.9	2.5	2.1	2.2	
Has some kind of disability[c]					0.000
Yes	0.6	1.0	2.2	1.4	
No	99.4	99.0	97.8	98.6	
Population in vulnerable situation[d]					0.938
Yes	0.9	0.8	0.9	0.9	
No	99.1	99.2	99.1	99.1	
Has health plan					0.097
Yes	9.1	6.8	7.4	7.5	
No	90.9	93.2	92.6	92.5	
Of the event					
Location of the event					0.000
Home[e]	85.4	69.5	47.3	64.4	
Public road	7.9	14.7	21.6	15.9	
School	2.4	9.6	19.5	11.9	
Leisure area	1.3	3.3	7.9	4.6	
Other[f]	2.9	2.9	3.7	3.2	
Nature of injury					0.000
No injury	16.7	14.1	8.6	12.5	
Contusion / sprain / dislocation	33.9	28.6	35.4	32.2	
Cut/laceration	21.9	33.4	29.9	29.8	
Fracture / amputation / trauma[g]	17.9	16.2	20.5	18.1	
Other[h]	9.7	7.7	5.7	7.4	
Body part affected					0.000
Head / neck	62.7	50.7	30.4	45.2	
Chest / abdomen / pelvis	3.7	3.8	4.1	3.9	
Upper limbs	16.3	21.7	31.5	24.5	
Lower limbs	9.4	18.7	28.5	20.7	
Multiple organs / parts	7.8	5.2	5.5	5.8	
Of care					
Transport to hospital					0.229
Walking / bus / minibus	22.3	25.5	25.0	24.6	
Private car	60.6	59.1	59.4	59.5	
SAMU / ambulance / rescue	14.5	12.4	12.1	12.7	
Other[i]	2.6	3.1	3.6	3.2	
Period of care					0.133
Daytime	55.7	58.3	59.7	58.3	
Nighttime	44.3	41.7	40.3	41.7	
Day of care					0.167
Saturday and Sunday	26.1	28.0	25.3	26.6	
Monday through Friday	73.9	72.0	74.7	73.4	
Previous care in another facility					0.106
Yes	37.8	36.5	34.2	35.9	
No	62.2	63.6	65.8	64.1	
Development					0.076
Discharge	79.3	83.1	81.4	81.7	
Hospitalization[j]	14.7	11.5	11.8	12.3	
Outpatient referral	4.9	4.5	5.8	5.1	
Other[k]	1.1	1.0	0.9	1.0	

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Table 2. continuation

Characteristics	Violence - Age group (years)[a]				
	0 to 1 (n = 140) %	2 to 5(n = 162) %	6 to 9 (n = 122) %	Total (n = 424) %	P value[b]
Sociodemographic					
Gender					0.106
Male	57.2	56.3	71.9	60.6	
Female	42.8	43.7	28.1	39.4	
Race/skin color					**
White	57.4	44.9	37.2	47.4	
Black/brown	41.1	53.1	60.0	50.5	
Yellow / indigenous	1.5	2.1	2.9	2.1	
Has some kind of disability[c]					**
Yes	0.0	1.5	1.9	1.0	
No	100.0	98.5	98.1	99.0	
Population in vulnerable situation[d]					**
Yes	0.9	0.5	0.0	0.5	
No	99.1	99.5	100.0	99.5	
Has health plan					0.836
Yes	4.6	4.9	6.5	5.2	
No	95.4	95.1	93.5	94.8	
Of the event					
Location of the event					**
Home[e]	92.7	75.1	38.2	72.4	
Public road	3.8	9.5	17.4	9.4	
School	1.6	11.2	37.8	14.3	
Leisure area	1.4	0.2	4.5	1.8	
Other[f]	0.4	4.0	2.1	2.2	
Nature of injury					0.020
No injury	20.5	18.4	9.5	16.9	
Contusion / sprain / dislocation	23.4	13.6	34.2	22.6	
Cut/laceration	20.7	35.8	31.8	29.1	
Fracture / amputation / trauma[g]	21.8	14.1	12.1	16.5	
Other[h]	13.6	18.1	12.4	14.9	
Body part affected					0.006
Head / neck	59.8	47.9	47.9	52.3	
Chest / abdomen / pelvis	3.8	15.3	8.0	9.0	
Upper limbs	25.8	13.3	25.3	21.3	
Lower limbs	3.1	10.1	13.9	8.6	
Multiple organs / parts	7.6	13.4	4.8	8.9	
Of care					
Transport to hospital					**
Walking / bus / minibus	27.5	21.9	35.4	27.4	
Private car	64.0	63.8	44.8	59.0	
SAMU / ambulance / rescue	6.6	13.0	15.4	11.2	
Other[i]	2.0	1.3	4.4	2.3	
Period of care					0.462
Daytime	52.0	60.6	55.6	56.1	
Nighttime	48.0	39.4	44.4	43.9	
Day of care					0.302
Saturday and Sunday	22.9	31.2	23.6	26.2	
Monday through Friday	77.1	68.8	76.4	73.8	
Previous care in another facility					0.591
Yes	29.9	35.7	28.5	31.7	
No	70.1	64.4	71.6	68.3	
Development					0.058
Discharge	79.1	82.3	84.5	81.7	
Hospitalization[j]	19.0	11.7	9.9	14.0	
Outpatient referral	1.9	2.6	5.6	3.1	
Other[k]	0.0	3.4	0.0	1.3	

Source: Ministry of Health, Secretariat of Health Surveillance, Violence and Accident Surveillance System –VIVA, 2014 Survey.
* Except Florianópolis/SC and Cuiabá/MT, which have not performed the survey. ** The chi-square test and p value have not been calculated due to the existence of cell with value less than five. [a] The number of attendances for some variables diverged due to missing data (unknown / blank). [b] Chi-square test. [c] Includes physical, mental, visual, hearing impairments and other disabilities / syndromes. [d] Includes gypsy, Quilombola, villager, people living in the streets and other. [e] Includes residence and collective housing. [f] Includes bar or similar, trade / services, industry / construction and other. [g] Includes head trauma, dental trauma and polytrauma. [h] Includes poisoning, burns and other. [i] Includes police car and other. [j] Includes hospitalization and referral to other service. [k] Includes evasion / escape, death and other.

Table 3. Comparative analysis of emergency attendances among children victims of violence/ accidents and associated factors, according to age. Crude OR and adjusted for age, gender and skin color - 24 capitals and Federal District, Brazil, 2014.

Characteristics	Type of event[a]							
	Violence (n = 424) %	OR	Accidents (n = 8,164) %	crude OR	adjusted OR	CI(95%)	Total (n = 8,588) %	p value[b]
Sociodemographic								
Gender								0.941
Male	60.6	1	60.3	0.99	0.93[a]	0.73 - 1.20	60.4	
Female	39.4	1	39.7	1.01	1.07[a]	0.84 - 1.37	39.7	
Age group (years)								0.000
0 to 1	37.5	1	20.3	0.42	0.44[b]	0.35- 0.57	21.4	
2 to 5	37.2	1	42.4	1.24	1.23[b]	0.95 - 1.60	42	
6 to 9	25.3	1	37.4	1.77	1.71[b]	1.34 - 2.20	36.6	
Race/skin color								0.000
White	47.4	1	34.2	0.61	0.65[c]	0.52 - 0.82	35	
Black/brown	50.5	1	63.6	1.31	1.27[c]	1.13 - 1.44	62.8	
Yellow / indigenous	2.1	1	2.2	1.06	1.05[c]	1.02 - 1.08	2.2	
Has some kind of disabilityc								**
Yes	1	1	1.4	1.31	1,15	0.43 - 3.10	1.3	
No	99	1	98.6	0.77	0.87	0.32 - 2.35	98.7	
Population in vulnerable situation								**
Yes	0.5	1	0.9	1.66	1.84	0.62 - 5.46	0.9	
No	99.5	1	99.1	0.60	0.54	0.18 - 1.61	99.1	
Has health plan								0.163
Yes	5.2	1	7.5	1.48	1.60	0.91 - 2.80	7.3	
No	94.8	1	92.5	0.68	0.63	0.36 - 1.10	92.7	
Of the event								
Location of the event								0.001
Home	72.4	1	64.4	0.71	0.90	0.69 - 1.17	65	
Public road	9.4	1	15.9	1.85	1.54	1.04 - 2.27	15.5	
School	14.3	1	11.9	0.81	0.62	0.44 - 0.87	12	
Leisure area	1.8	1	4.6	2.70	2.19	0.91 - 5.28	4.4	
Other	2.2	1	3.2	1.52	1.46	0.70 - 3.04	3.2	
Location of the event								0.004
Home	72.4	1	64.4	0.71	0.90	0.69 - 1.17	65	
Away fromhome	27.6	1	35.6	1.40	1.11	0.85 -1.44	35.1	
Nature of injury								0.000
No injury	16.9	1	12.5	0.70	0.79	0.57 - 1.08	12.8	
Contusion / sprain / dislocation	22.6	1	32.2	1.63	1.60	1.17 - 2.21	31.5	
Cut/laceration	29.1	1	29.8	1.04	0.98	0.75 - 1.26	29.7	
Fracture / amputation / traumag	16.5	1	18.1	1.11	1.09	0.74 - 1.61	18	
Other	14.9	1	7.4	0.45	0.49	0.34 - 0.71	7.9	
Body part affected								0.000
Head / neck	52.3	1	45.2	0.87	1.01	0.77 - 1.33	45.6	
Chest / abdomen / pelvis	9	1	3.9	0.69	0.65	0.36 - 1.18	4.2	
Upper limbs	21.3	1	24.5	0.14	0.14	0.07 - 0.27	24.2	
Lower limbs	8.6	1	20.7	2.03	1.72	1.27 - 2.35	19.9	
Multiple organs / parts	8.9	1	5.8	0.68	0.70	0.43 - 1.15	6	

it continues

Table 3. continuation

Characteristics	Type of event[a]							
	Violence (n = 424) %	OR	Accidents (n = 8,164) %	crude OR	adjusted Or	CI(95%)	Total (n = 8,588) %	p value[b]
Of care								
Transport to hospital								0.609
Walking / bus / minibus	27.4	1	24.6	0.86	0.83	0.62 - 1.11	24.8	
Private car	59	1	59.5	1.02	1.08	0.83 - 1.39	59.5	
SAMU / ambulance / rescue	11.2	1	12.7	1.15	1.13	0.78 - 1.63	12.6	
Other	2.3	1	3.2	0.86	0.83	0.62 - 1.11	3.1	
Period of care								0.555
Daytime	56.1	1	58.3	1.09	1.05	0.78 - 1.42	58.2	
Nighttime	43.9	1	41.7	0.92	0.95	0.71 - 1.28	41.8	
Day of care								0.884
Saturday and Sunday	26.2	1	26.6	1.02	1.02	0.74 - 1.41	26.6	
Monday through Friday	73.8	1	73.4	0.98	0.98	0.71 - 1.35	73.4	
Previous care in another facility								0.217
Yes	31.7	1	35.9	1.02	1.02	0.74 - 1.41	35.6	
No	68.3	1	64.1	0.98	0.98	0.71 - 1.35	64.4	
Development								**
Discharge	81.7	1	81.7	1.00	1.00	0.71 - 1.40	81.7	
Hospitalization	14	1	12.3	0.86	0.87	0.61 - 1.24	12.4	
Outpatient referral	3.1	1	5.1	1.67	1.60	0.82 - 3.13	4.9	
Other	1.3	1	1	0.77	0.86	0.24 - 3.04	1.0	

Adjusted OR for age, gender and skin color. [a] Adjusted OR for age and skin color. [b] Adjusted OR for gender and skin color. [c] Adjusted OR for age and gender.

running and using bikes, bicycles, skates, among others[17,18]. In addition, the occurrence of violence was more common among boys. This finding is in accordance with a review on violence and health studies, reiterating a higher occurrence of violence among boys[19]. Social inequalities and gender issues are, therefore, implicated in violence against children and adolescents. Early introduction of male universe symbols that encourage violence, such as toy guns and swords, fight and violence movies and games can naturalize these behaviors[18].

The age group with the largest occurrence of accidents was 2-5 years, compatible with previous editions of the VIVA Survey[13,14]. However, other studies show different results, with higher frequency of accidents in older children (7-12 years)[20], among those aged 1-3 years[21] or 1-9 years[16], depending on the stratification of study or profile of services. Home is the most frequent place of occurrence of these injuries, as described in other studies[12,17,26], it is where children spend most of their time[22,23].

The finding on falls as the most common type of accident in childhood is consistent in the literature[20-22]. The greater autonomy and exposure to games such as racing and games can also be reasons for the higher occurrence of other accidents (collision with objects/people, sprains/crushes and falling objects), especially among the 2 to 9 years olds[21,20].

In this context, preventive measures should be taken by parents and guardians, such as care with wet floors, adopting safety measures for furniture sharp angles, glass objects, cribs, windows and stairs, care with throw rugs, scattered toys, small parts which can be introduced in body orifices, care with kitchens, hot pots, irons, storage of medicines and products, electrical outlets, domestic animals, plants and others[21,23]. In addition, the most important thing is constant adult supervision, seeking protection against environmental risks and educational attitudes[23].

The fact that road injury are the third most

Table 4. Emergency care for violence among children by age group - 24 capitals* and the Federal District, Brazil, from September to October, 2014.

Characteristics	Age group (years)[a]				
	0 to 1 (n) %	2 to 5 (n) %	6 to 9 (n) %	Total (n) %	P value[b]
Type of accident	(1,742)	(3,494)	(2,928)	(8,164)	0.000
Road injury	5.1	9.1	12.1	9.4	
Fall	63.1	50.8	48.3	52.4	
Burn	4.8	1.7	1.4	2.2	
Other accidents	27.0	38.4	38.3	36.0	
Road injury: type of victim	(112)	(361)	(392)	(865)	0.000
Pedestrian	20.2	29.2	32.5	29.8	
Driver	13.8	21.8	40.0	29.6	
Passenger	66.0	49.0	27.5	40.6	
Road injury: means of victim's transport	(112)	(361)	(392)	(865)	0.000
Walking	20.2	29.2	32.5	29.8	
Car	33.6	10.9	6.1	11.1	
Motorbike	17.9	11.8	9.2	11.2	
Bicycle	24.9	40.9	45.8	41.5	
Bus/minibus/other	3.4	7.1	6.3	6.3	
Type of fall	(1,092)	(1,793)	(1,376)	(4,261)	0.000
Same level	31.7	49.6	60.2	48.9	
Bed/furniture	42.5	22.6	9.8	23.0	
Ladder/step	10.7	13.2	9.7	11.4	
Tree/roof/scaffold/slab	0.9	1.9	6.7	3.3	
Hole/other levels	14.2	12.8	13.6	13.4	
Type of burn	(73)	(62)	(41)	(176)	**
Fire/flame	1.8	10.3	19.5	8.7	
Hot substance	72.8	48.4	69.0	64.0	
Hot object	21.6	29.2	5.7	20.3	
Other[c]	3.8	12.2	5.9	7.0	
Other accidents	(450)	(1,255)	(1,102)	(2,807)	0.000
Cutting injury	4,5	8,5	14,5	10,3	
Accidents with animals	12.4	12.7	13.5	13.0	
Object falling on person	12.8	12.7	7.3	10.6	
Collision with object/person	15.7	18.9	32.1	23.7	
Sprain/crushing	19.7	13.2	15.2	15.0	
Other[d]	34.9	34.0	17.4	27.5	

Source: Ministry of Health, Secretariat of Health Surveillance, Violence and Accident Surveillance System –VIVA, 2014 Survey.
* Except Florianópolis/SC and Cuiabá/MT, which have not performed the survey. ** The chi-square test and p value have not been calculated due to the existence of cell with value less than five. [a] The number of attendances for some variables diverged due to missing data (unknown / blank). [b] Chi-square test. [c] Includes electrical shock and chemical substances. [d] Includes choking / suffocation, foreign body, drowning, poisoning / intoxication, injury by firearms, others.

frequent external cause of care to children in urgent and emergency care services goes against the relevant information that this type of occurrence is the first cause of mortality among children aged 1-9 years in Brazil and worldwide[1,12]. SIM data show that the most frequent causes of children traffic deaths are pedestrian trampling, followed by vehicle occupants, and bikes comes in fifth place[12]. Deaths by trampling show the importance of adult supervision when crossing streets with children and moving them on roads. A positive highlight in Brazil has been reduced

Table 5. Emergency care for violence among children by age group - 24 capitals* and the Federal District, Brazil, from September to October, 2014.

Characteristics	Age group (years)[a]				
	0 to 1 (n) %	2 to 5 (n) %	6 to 9 (n) %	Total (n) %	P value[b]
Type of violence	(140)	(162)	(122)	(424)	**
Self-inflicted injury	0.8	4.4	2.3	2.5	
Aggression[c]	99.2	95.6	97.7	97.5	
Nature of violence/aggression	(135)	(146)	(112)	(393)	**
Physical	14.6	25.4	75.2	33.4	
Sexual	0.8	4.8	4.3	3.1	
Psychological	0.0	0.5	0.0	0.2	
Neglect	84.1	69.4	20.6	63.2	
Other	0.4	0.0	0.0	0.2	
Means of aggression	(132)	(147)	(113)	(392)	**
Body strength / beating	10.9	21.4	50.7	24.8	
Firearm	0.8	2.4	1.9	1.7	
Sharp objects	1.1	3.7	7.5	3.7	
Pointed objects	0.8	2.3	15.2	5.0	
Other	86.4	70.3	24.9	65.0	
Family member as aggressor	(135)	(146)	(111)	(392)	**
Yes[d]	92.4	75.5	35.5	72.0	
No	7.6	24.5	64.5	28.0	
Gender of likely aggression perpetrator	(114)	(122)	(92)	(328)	0.0406
Male	17.0	38.5	62.7	36.4	
Female	83.0	61.6	37.3	63.7	

Source: Ministry of Health, Secretariat of Health Surveillance, Violence and Accident Surveillance System –VIVA. 2014 Survey. * Except Florianópolis/SC and Cuiabá/MT, which have not performed the survey. ** The chi-square test and p value have not been calculated due to the existence of cell with value less than five. [a] The number of attendances for some variables diverged due to missing data (unknown / blank). [b] Chi-square test. [c] Includes abuse and intervention by legal public officer. d Includes father/ mother and other family members.

traffic deaths due to the use of car seats and safety equipment[24,25].

The same recommendation goes for burns, most frequent in children aged 0 to 1 year and caused by hot substances and objects, also requiring adult supervision[26].

With regard to findings on violence, examining the prevalence of neglect in children under 1 year and physical violence in older children, these are in line with findings from other countries, where both types of violence stand out. Physical violence is relevant in the Philippines and the United States, with 75% and 47%, respectively[19]. Other studies highlight neglect as the main occurrence of violence in this age group[27]. Social and cultural factors, as well as those from notification of health care systems in different contexts can support this discussion. Furthermore, findings on sexual violence are consistent with other studies that show its higher prevalence in children above 10 years, while sexual exploitation higher prevalence is noted as from the age of 14[28].

External causes are very common in the world and in Brazil[2] and are a serious public health problem that is still underreported. Because of childhood vulnerability, violence remains mostly silent, underestimated and brings negative consequences to children's physical and mental health[13,29]. VIVA breaks this silence, allowing health services to grasp this reality and take protective measures to break the vicious circle of suffering[13,14].

The likely perpetrators of violence are mostly female and family members, consistent with what has been reported in other studies, which have identified attackers as the victim's mother or father or the mother's boyfriend or partner[19,30,31]. Accident- and violence-related injuries affect more often the head and may increase the risk of serious injury, such as head trauma[23]. This find-

ing is consistent with the study by Cavalcanti[32], which showed that 69.1% of children injuries are located in head and face, followed by the upper and lower limbs.

Among the limitations of this study, we quote the use of the strategy of CNES-accredited public urgent and emergency care services, excluding emergency facilities of private hospitals. We chose to use sentinel services, which brings advantages, because they deal with external causes involving children and have already participated in previous editions of VIVA. The drawback is that they are not population estimates, although public hospitals focus most attendances on external causes and can be a universe proxy. Moreover, due to the difficult topic analyzed, data on violence against children may be omitted due to underreporting and the difficult identification and assessment of cases of neglect, physical, sexual and psychological violence on children, especially when committed by family members.

The issue of violence against children is gaining visibility and importance in the international and national agendas[1,2,33]. In Brazil, the Statute of Children and Adolescents (Law no. 8069/1990) established a legal framework for the protection of children's rights[10], and the use of VIVA's information has promoted coordination between health and intersectoral services to protect victims of violence, integrating healthcare, health promotion and violence prevention and control actions[13,14,33].

Much global progress has been achieved in preventing violence against children, but there is still much to be done, and several factors limit the impact of preventive measures, among which are, as quoted by the WHO, social inequalities, which affect differently rich and poor kids[1,2]. No violence against children is justifiable and all can be prevented. Governments should commit to protect children from all forms of violence. All sectors of society share the responsibility of condemning and preventing violence against children and dealing with child victims[1,2]. The SDGs renew commitments to children's health, seeking to ensure a better future for our children[12].

Conclusion

The main results of the 2014 VIVA Survey relating to events in children under 10 years in public urgent care gateways show that accidents were more frequent (95%) than violence. In general, events consisted of mild cases that led to discharge. The 2-5 years age group suffered most accidents. Among accidents, the predominant causes were falls from own height in older children (6-9 years) and from the crib/bed up to 1 year of age, followed by other accidents, and third were road injury. Road injury predominated in children aged 6-9 years and non-motorized bikes/bicycles, tricycles and similar were the most frequent victims' means of transport among children aged 6-9 years. Burns occurred in about 2% and were more frequent in the 0-1 year group. The events were more frequent at home, in male children and those in the 2-5 years group. Hospitalizations were predominant in children under 1 year.

Neglect was the most frequent violence, accounting for about two-thirds, and predominated in children under 1 year, and physical violence prevailed in older children. The probable perpetrator of violence was a family member of children in two-thirds of the events. Women were most frequent likely aggressor for children under 1 year, and men in children aged 6 to 9 years.

The preventability of these events is clear, and it is necessary to involve families, schools, society and governments. Children are exposed to hazards and risks in their daily lives and are vulnerable everywhere to various types of injury; however, society should ensure them a protective environment[1,2] that can guarantee their physical, social, cultural development.

Collaborations

DC Malta worked on the design of the study, on the analysis and interpretation of the data and on the critical review, also approved the version to be published. MDM Mascarenhas and RTI Bernal performed the analysis and interpretation of the data and the final revision of the text. MMA Silva, MGO Carvalho, LA Barufaldi and JQ Avanci contributed with critical analysis, final revision of the text. All authors approved their final version.

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Erratum

p. 3729

where it reads:
Jovina Quintes Avanci

It should read:
Joviana Quintes Avanci