

Mortality by road traffic accidents in adolescents and young people, Brazil, 1996-2015: will we achieve SDG 3.6?

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Abstract *This paper aims to analyze the main characteristics of Road Traffic Accidents (RTA) mortality in Brazil for the period 1996-2015, focusing on the 10-29 years' age group. This is a two-step study consisting of (i) a bibliographic review on the topic of traffic violence in Brazil, and (ii) a study on RTA mortality in the Mortality Information System (SIM). The former situates the state of the art of scientific production on the theme and produces the theoretical reference for the analysis of the latter. During the period, about 39,000 people died by RTA, of which about 13,200 adolescents and young people died. The country should curb mortality to somewhere around 19,500/year and, among adolescents and young people, to 6,500/year to achieve SDG 3.6. With the establishment of the Brazilian Traffic Code (CTB), RTA mortality rate fell between 1997 and 2000. The rate increased in the subsequent decade. The focus on adolescents and young people help us understand that, in the post-CTB and Prohibition, male black and brown motorcyclists became the main victims. The literature provides data analysis and shows that reduction is currently submitted to an articulated discussion that involves worker's health, gender, employment, urban mobility and advertising policies. Concerning SDG, this means that achieving SDG 3.6 is a process that involves interacting with policies targeting other SDGs.*

Key words *Traffic accidents, Policies, SDG*

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Introduction

A global problem, traffic violence received particular attention from the United Nations, which included it in the Sustainable Development Goals (SDG) and Agenda 2030, via target 3.6: *by 2020, halve the number of global deaths and injuries from road traffic accidents*¹.

In Brazil, from 1996 to 2015, 21,057,086 people died, of which 2,656,875 were due to External Causes (12.6%). Among the External Causes, Road Traffic Accidents (RTA) appear as the second most recurring cause, accounting for the death of 733,120 people (27.6% of the deaths from the cause and 3.5% of the total deaths for the period)². Of the total number of road traffic fatalities, 264,643 (36.1%) were people aged 10-29 years, which means that, in Brazil, from 1996 to 2015, on average, 36 young people/day died by RTA.

The data are more conclusive when working morbidity: from 1998 to 2015, 2,272,068 people were hospitalized by RTA, and 1,046,225 (46.0%) were aged 10-29 years, an average of 159/day³. Thus, young people are one of the primary victims of this manifestation of violence and, therefore, the universe of this study focuses on their mortality by RTA.

National initiatives to cope with traffic violence have focused on legislation with more punitive tendencies, such as the 1998 Brazilian Traffic Code (CTB) and Law N° 11.705 of 2008 (Prohibition). Although punitive measures and sanctions are appropriate, it is imperative to understand that manifestations of violence are polysemic and complex, and require a holistic analysis of the relationships that give rise to them.

In the case of traffic violence, one cannot discuss coping measures that do not analyze, among others, issues of worker health (motorcycle courier drivers and other categories of drivers with high exposure to RTA); mental health (both with respect to the psychological conditions for driving concerning the use of alcohol and other drugs); poor preservation of roads and public highways; media appreciation of cars' speed and drivers' audacity; public policies and societal actions covering the automotive industry the development of safe vehicles with accident prevention technologies; public transport, urban mobility and sustainable cities; and traffic education policies for drivers and in schools.

With this in mind, this paper intends to contribute to the debate and fight against traffic violence. Thus, it assumes the objective of analyzing

the main characteristics of RTA-related mortality in Brazil among people aged 10-29 years, from 1996 to 2015, seeking to subsidize policies that facilitate target 3.6 of the SDGs/2030 Agenda.

Methodological aspects

The study was carried out in two articulated stages. The first one consisted of a bibliographical review of the topic of *traffic violence in Brazil*. The second one consisted of a study on mortality by RTA in the Mortality Information System (SIM). The proposal is that the former locates the state of the art of scientific production on the theme and produces the theoretical reference for the analysis of the latter.

Brazil has a historical difficulty in delimiting "adolescence" and "youth": there are divergent definitions; some other definitions are not divergent and focus their analysis on different characteristics (some in chronology and biology, others in the social issue, for example); legislations are in place, such as the Statute of the Child and Adolescent (ECA)⁴ and the Youth Statute (EJ)⁵, which formalize different age segments; and we have the SIM, which works with its age groups.

As it is of interest to the paper to study Brazilian traffic violence and, from there, to make a contour of adolescents and young people, we adopted the 10-29 years' age group. This option covers and articulates three essential references for the study: (i) the Youth Statute, which defines as "young" people aged 15-29 years; (ii) the ECA, which considers as "adolescents" people aged 12-18 years; and (iii) WHO, which establishes the period between 10-19 years as "adolescence"⁶.

The bibliographic review focused on the scientific production published in the SciELO database. The research conducted on July 19, 2017, adopted as search strings *traffic*, *traffic violence* and *traffic safety*, and as search fields, *Title* and *Summary* (*free translation of words and sentences from Portuguese*).

In parallel, the SIM was investigated for deaths caused by Road Traffic Accidents. The time bracket 1996-2015 was adopted to cover the entire period in which the System codifies its information according to the 10th Revision of the International Classification of Diseases (ICD-10)⁷.

In ICD-10, Transport Accidents⁸ are in Chapter XX - External causes of morbidity and mortality, and are classified in specific clusters, according to the type of victim: Pedestrian (V01-V09)

Pedal cyclist (V10-V19), Motorcycle rider (V20-V29), Occupant of three-wheeled motor vehicle (V30-39), Car occupant (V40-V49), Occupant of pick-up truck or van (V50-V59), Occupant of heavy transport vehicle (V60-V69), Bus occupant (V70-V79), Other road traffic accidents (V80-V89), Water transport accidents (V90-V94), Air and space transport accidents (V95-V97), Other and unspecified transport accidents (V98-V99).

This paper will consider the types of victims related to Road Traffic Accidents (V01 to V89).

Traffic Violence in Brazil: reflections from a bibliographical review

The literature review revealed the role of the health sector in studies on traffic violence: of the 170 papers, 135 (79.4%) were published in journals in this field, with emphasis on *Cadernos de Saúde Pública* (24), *Revista de Saúde Pública* (20) and *Ciência & Saúde Coletiva* (17), which concentrate 45.2% of the works. Another 22 papers (12.9%) stem from the field of Psychology and Social Psychology. The remaining 13 (7.6%) are distributed across Social and Political Sciences (4), Geography and Geosciences (2), Demography (3), Economics (1), Architecture and Urbanism (2), and Media (1) journals.

The oldest paper of this review was published in 1972. From that year until 2001, another 19 were published. Since then, the number of papers has grown considerably: from 2002 to June 2017, 151 were published in an annual upward movement.

The 170 selected papers were classified into 8 categories created from the object of study of the papers, which becomes the criterion of inclusion and exclusion in the categories: *Alcohol and Drugs*: papers whose objects are blood alcohol levels and TA-related psychoactive alterations; *Attention and Care*: characteristics and strategies of care for traffic victims; *Behavior*: behaviors and risk behavior conducts and patterns in traffic; *Gender*: discourses and patterns of conduct by gender in traffic relationships; *Costs*: hospital expenses and loss of productivity of the injured in traffic; *Work Accidents*: impact of traffic violence on the achievement of work and health of workers; *Promotion and Prevention*: public policies to fight against traffic violence; and *Morbimortality*: epidemiological profile of fatal and non-fatal victims.

Morbimortality (61 papers, 35.9% of the total) is the one that gathers more papers, followed

by *Promotion and prevention* (32, 18.8%); *Behavior* (23, 13.5%); *Work Accidents* (18, 10.6%); *Attention and Care* (16, 9.4%); *Alcohol and Drugs* (15, 8.8%); *Gender* (3, 1.8%); and *Costs* (2, 1.2%).

The following is a summary of these categories to construct the theoretical reference of the paper, which is the basis of the analysis of data on mortality of adolescents and young people, presented later.

Behavior

The papers in this category discuss the relationships that involve traffic issues in Brazil, highlighting social, cultural, status and power aspects.

Rozestraten⁹ analyzes the traffic as a social problem in which cars, pedestrians, buses, motorcycles, bicycles, trucks, etc. move according to their interests and positions, in different directions, disputing space. The author concludes that *the interests of persons participating in the traffic are not the same and necessarily clash*.

Pitanga¹⁰ stresses that by producing a situation of constant conflict and tension in a space that is believed to be equal for all – the street – traffic tends to become a socially hierarchical space.

Thus, in Brazil, the vehicle emerges not only as a means of locomotion but as an instrument of status and oppression, becoming a symbol of superiority, object of desire and social ascension, with which the “motorized citizen” enjoys power, freedom, and sense of privilege.

Hantower¹¹ affirms that the conflict between pedestrians and drivers is a reflection of the inequality expressed in national traffic, where vehicular traffic is privileged in front of pedestrians.

Based on the 2012 National School Health Survey (PeNSE), Duarte and Garcia¹² evaluated the prevalence and factors associated with the behavior of schoolchildren under the age of 18 who drive without a license in Brazil. Of the 106.621 survey respondents, 27.0% said they had driven at least once in the previous 30 days, while 12.9% said they frequently drove (4 or more times). Realizing a prevalence of this behavior in males, the authors consider that, to adolescents, the act of driving is a symbol of social status not allowed for the children, an expression of independence of the parents’ vigilance. Driving would be part of a process of conquest and establishment of autonomy, interaction and social acceptance.

Sauer and Wagner¹³ argue that the pressure exerted by cohabitation groups, emotional immaturity and little experience in traffic make

young people more susceptible to risky behaviors that influence driving: alcohol and drug use, speeding, illegal maneuvers, carelessness with safety equipment, a feeling of omnipotence and a tendency to overestimate their abilities.

Gender

In addition to hierarchizing the different qualities of road users and distinguishing adolescent groups, the papers gathered here indicate that traffic also reflects values, stereotypes, and behaviors based on gender and gender relationships.

Investigating perceptions about drivers, in Recife, in 2005, Almeida *et al.*¹⁴ identified that female drivers tend to perceive themselves and to be perceived by men as prudent, attentive and cautious, with a tendency to obey traffic rules, practicing a more defensive direction, with a greater vision of danger and causing fewer accidents. On the other hand, they are also seen as slow, insecure and dangerous drivers. Men see themselves and are seen by women as reckless and aggressive at the wheel: they jump the queues, they make risky maneuvers, they brake at the last minute. However, they are identified as safer and more determined. Authors affirm that these perceptions reflect a patriarchal society that encourages men not to respect the rules of traffic to assert themselves as machos, imposing themselves by virility.

In another paper, when comparing the risk behavior among men and women involved in RTA from a survey of 609 victims attended in emergencies in Porto Alegre, Saldanha *et al.*¹⁵ found that more than 70% of the victims were male. Of these, 75.2% were drivers. Among women, 18.6% were drivers. The study showed a higher frequency of alcohol, marijuana, and cocaine use among men, and greater use of anxiolytics among women.

These papers consolidate an understanding that, to achieve the reduction proposed by SDG 3.6, not only repressive measures should be adopted, which also explains the option of starting the analysis of the bibliographic review by such categories.

Alcohol and Drugs

Papers in this category work on alcohol, marijuana, stimulants, opiates and so forth as risk factors in the driving of vehicles, causing psychophysical and neuromotor changes in the drivers,

compromising the coordination, the integrity of the reflexes and the peripheral vision; modifying the perception of speed, the reaction time, the ability to concentrate, vigilance and alertness; causing sedation, drowsiness and indifference to external stimuli; and compromising, also, the maintenance of self-criticism^{16,17}.

Studying risk factors associated with accidents and violence in the city of Rio de Janeiro, between 1998 and 2005, Cruz *et al.*¹⁸ identified that, of the 1,300 medical records of the Forensic Medicine Institute in which positive blood alcohol levels were identified, 570 (43.8%) were from RTA.

When investigating the risk of frequent alcohol abuse in traffic accidents, based on the 2013 National Health Survey of 2013, Damascena *et al.*¹⁹ found that young people should be the focus of *public policies on the issue of motor vehicle traffic accidents and alcohol abuse*.

In view of this reality, the principal measures adopted in Brazil are the repressive hardening of legislation, as Nascimento and Garcia²⁰ point out: Decree-Law No. 3.651, of 1941, which sanctioned drivers in a state of proven drunkenness; Resolution No. 737 of the CONTRAM, of 1989, which regulates the actions and means of proving the driver's drunk driving; institutionalization of the CTB, which criminalizes the act of drunk driving; and the enactment of Law No. 11.705 (Prohibition), which creates zero tolerance to alcohol in drivers and establishes mechanisms of supervision and punishment.

Work Accidents

The papers in this category show that RTA also converge with occupational accidents.

In the 1970s, when analyzing fatal work accidents in the city of Campinas, Ferreira and Mendes²¹ found that *motor vehicle traffic accidents* accounted for 50.1% of all fatal work accidents, emerging as the most frequent external cause for this type of accident, and *transport vehicles' drivers* were the most affected professional category. As a result, they stated that work and traffic accidents are indissociable, warning the company's responsibility in their prevention.

Particular attention should be paid to RTA involving motorcycles. A cheap alternative to cars, efficient in the combination of transport-work in the chaotic traffic of large cities, and an option to inefficient collective transportation, motorcycles predominate in the delivery market, providing a possibility of income for young people without professional qualification²².

Studying the characteristics of motorcycle courier drivers' accidents in Londrina and Maringá, in 2005-2006, Soares et al.²³, found that 82.9% of the respondents reported accidents at work and 56.3% knew colleagues that had been removed from work due to motorcycle accidents.

According to the Denatran²³, in Brazil, the motorcycle fleet increased by 137.8% between 2002 and 2008 and consecrated as the most popular means of individual transport in the country, totaling about 25% of the national car fleet²².

On the other hand, a 190.5% increase in the number of RTA fatalities involving motorcyclists²³ was recorded between 2000 and 2006. Also, motorcyclists were *seven times more likely to show a higher risk of death, four times more likely to show bodily injury and twice as many pedestrian trampling compared to car drivers*²².

The behavior of motorcycle courier drivers is due to pressure from customers and companies for faster deliveries; poor employment relationships, which involve the lack of formal contracts and traveling expenses compensation; low wages; stressful working hours; productivity pressure; and the permanent risk of accidents²²⁻²⁵.

Truck drivers also face long working hours, low wages, rush to get to the destination, few sleep hours, poor quality of health and life and frequent risk of accidents. This makes them extremely amenable to the use of amphetamines, potent stimulants with very high risk for RTA²⁶.

According to the National Department of Transportation Infrastructure, 331,652 traffic accidents (TA) were registered on federal highways in 2011. Of these, 93,066 (28.1%) involved trucks. As a result, truck drivers ranked second among deaths and were those most affected by morbidity, especially temporary and total disability²⁷.

Promotion and Prevention

Because of the relationships studied so far, one of the most important aspects of coping with traffic violence is promotion and prevention strategies.

In this context, the Conferences of Moscow (2009) and Brasília (2015) were significant milestones. Pavarino Filho²⁸ considers that both have the same bases, and Brasília's document is more specific and detailed, emphasizing risk and vulnerability; morbimortality; equity and inclusion; goals and indicators; and capacity building and education.

Nardi et al.²⁹ highlight the main recommendations of the Brasília Declaration: adoption of

legislation to ensure investment in safe infrastructure on highways and urban roads; speeding control; coping with alcohol abuse; and care of victims. It also recommends the *prioritization of sustainable means of transport (...) the safety of pedestrians, cyclists, motorcyclists and public transport users*.

Studying RTA-related mortality in young people aged 0 to 19 years in Brazil, Faria and Braga³⁰ consider that the measures adopted prioritized motor vehicles, and it was necessary (...) *to reorganize traffic and urban areas to ensure the rights of the pedestrian-citizen and break with the practices that promote segregation and isolation of communities*. They also consider traffic education as a fundamental tool to reduce morbimortality in the medium and long term, in a process that leads children and adolescents to (...) *reflect on the ethical aspects of traffic behavior, to understand the reasons for traffic rules (security for all people)*.

Attention and Care

When not avoided, RTA must receive emergency care that according to the papers in this category must be provided before the victim's arrival at the hospital. According to Malvestio and Cardoso de Sousa³¹, prehospital care in the first minutes after the trauma, with resuscitation and stabilization measures, can prevent the worsening of the condition *and influence the survival of the victim, keeping it in a position to come alive until hospital treatment is possible*. The authors highlight the role of the Pre-Hospital Mobile Care (APH), technology of initial care for trauma patients, with two modalities: Basic Life Support, which does not perform invasive procedures; and Advanced Life Support, which performs them.

Pointing out that 40% of deaths occur in the prehospital phase of care, Ladeira and Barreto³², affirm that *the first hour (Golden hour) after the occurrence of a traumatic injury is (...) the critical time for the institution of treatment that will change the prognosis*. Thus, the pre-hospital care time is shown by *total time: response time* (accident occurrence, calling the mobile unit, call reception, exit of the ambulance and arrival at the scene), *scene time* (time spent at the scene), *time of transport* (time between the scene and the hospital)^{32,33}.

According to Pereira and Lima³⁴, the reduced service time requires that the APH be based on teamwork. They also draw attention to the need to prepare all the professionals who are part of the team, including the driver, who can assist on certain occasions.

A study on the perception of traffic accident victims attending an emergency hospital in the city of Fortaleza points out that *hospitalization is experienced with depression, anxiety, fear, sadness, concern, misinformation about the severity of the case, the prognosis, rights and duties linked to the traffic accident, of the legal, economic and social implications*³⁵.

These issues are exacerbated by fears of a return to daily life since treatment requires outpatient follow-up, rehabilitation, drug therapy continuity and costs with traveling means, which hinders return to work and increases uncertainties and concerns. This shows that care provided to LTA victims extends until after the accident and should support the resumption of daily activities.

Morbimortality

In Brazil, in 1950, 19% of the passengers of vehicles were transported by bus and 6.5% by automobiles; in the 1970s, these numbers increased to 66.3% and 22.2%, respectively. This change directly affected morbimortality by RTA³⁶.

Laurenti et al.³⁷ point out the significant increase in the traffic mortality coefficient in the city of São Paulo between 1950 and 1970: from 12.2 to 22.4 deaths per 100,000 inhabitants.

Mello Jorge and Latorre³⁸ show that, from 1978 to 1989, the annual deaths by RTA in the country increased from 17,795 to 27,611, peaking in 1986 with 29,574 deaths. They also found that these deaths were concentrated in young male adults.

Marín and Queiroz³⁹ reinforce this observation: in 1997, 73.1% of RTA cases involved males, and young people being the primary victims.

Bacchieri and Barros²² discuss the effectiveness of the Brazilian Traffic Code, in a study that covers the period from 1998 to 2010, stating that (...) *Strict laws, higher fines, and chapters dedicated to traffic education suggested that the problem would be solved. However, maintenance and, in some cases, increased mortality and hospitalization rates due to accidents prevailed.*

Based on the 2013 National Health Survey, Malta et al.⁴⁰ pointed out that 4 out of 5 adults 18 years of age or older reported wearing a seat belt in the front seat; only half reported using belts in the back seat; the use of helmets was declared by about 80% of the respondents, in both drivers and passengers; and that the use of such equipment is less frequent in rural areas, in the North and Northeast, and among young people aged 18-29 years.

Farage et al.⁴¹ analyzed the effectiveness of traffic safety measures in the Federal District between 1992 and 1997. They found that, although there was an increase in the coefficients of victims of traumatic brain injury by RTA, there was a reduction in cases of severe head trauma and the resulting deaths. They suggested that the safety measures studied are effective in reducing the severity of accidents and the number of deaths but are not adequate to reduce the number of accidents.

Costs

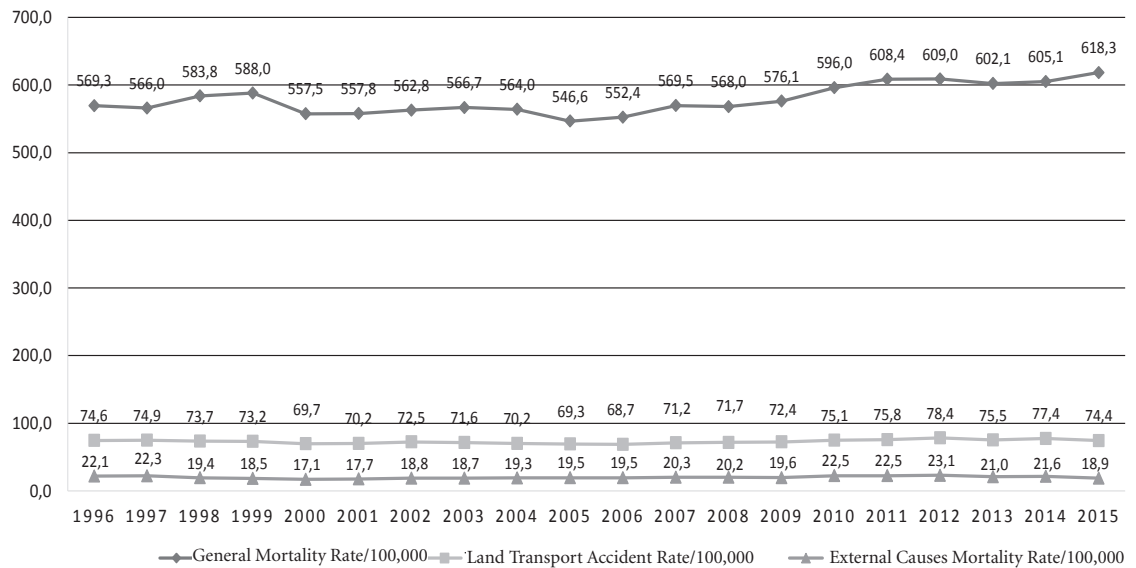
Based on data from the SIH/SUS, Andrade and Mello Jorge⁴² indicate that, in Brazil, in 2013, the total expenditures of 170,805 RTA-related admissions exceeded R\$ 230 million. They also point out that motorcyclists accounted for 51.9% of hospitalizations, which generated costs of R\$ 114,810,444.93. The same authors⁴³ analyzed the impacts of RTA through the social costs expressed by Potential Years of Life Lost: in 2013, the 42,266 RTA-related deaths recorded in Brazil generated a loss of more than 1,300,000 Potential Years of Life Lost, with a mean proportion of 33.8 years lost/death.

These studies conclude the overview discussed in this review, thus establishing the reference that will analyze the mortality data shown below.

Mortality due to Traffic Accidents in Brazil: 1996 to 2015

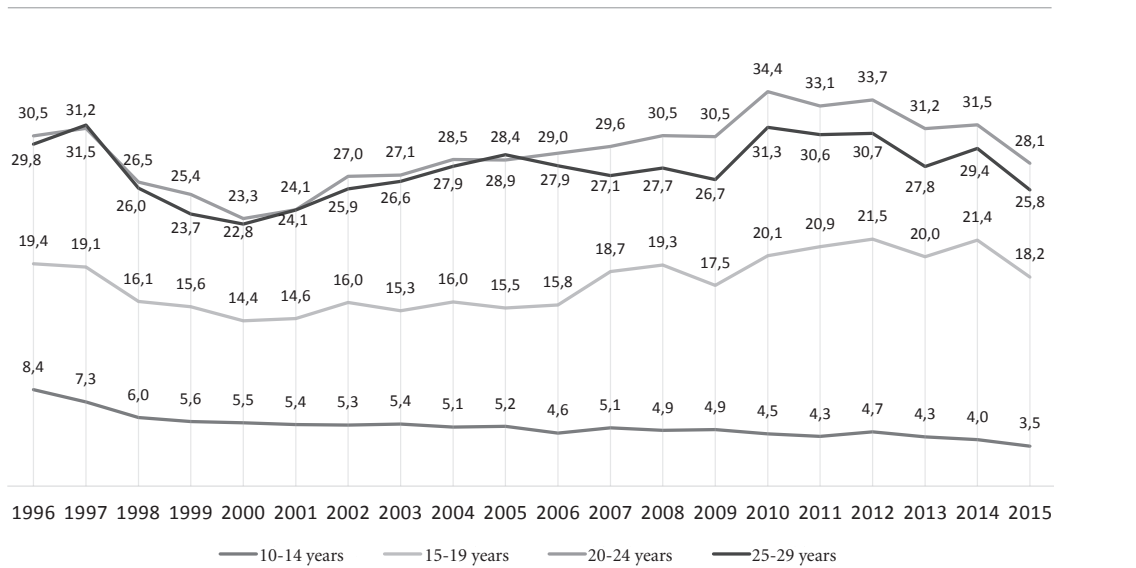
Graph 1 shows the RTA mortality rate in Brazil between 1996 and 2015, contextualizing it in the general mortality rates and by external causes. While the overall mortality rate shows growth from 2008 onwards, the others indicate stability, and mortality by RTA declines in 2015, which, if confirmed in later years, indicates a downward trend.

In Graph 2, the mortality rate by RTA is shown with a focus on the age groups of the subjects of the present study, evidencing that all have lower rates in 2015 than in 1996. It is noteworthy that the age range of 10-14 years has different behaviors, with constant and vigorous fall, unlike the others that alternate stability with certain growth. Another highlight is the 20-24-year age group, which, between 1996 and 2005, alternates with the 25-29 age group as the one with the highest incidence, but which, as of 2006, assumes this position.



Graph 1. Brazil - General Mortality, Mortality due to External Causes and Land Transport Accident Mortality. 1996 to 2015.

Source: MS/SVS/CGIAE – Mortality Information System – SIM.



Graph 2. Brazil – Land Transport Accident (LTA) Mortality among Young people aged 10 to 29 years. 1996 to 2015 (n = 264,643).

Source: MS/SVS/CGIAE – Mortality Information System – SIM.

Graph 3 shows the five most recurrent victim types among the subjects studied in the paper for the period studied. We wish to explain that “Other RTA” is a classification of ICD-10 that includes the items “V80-V89 Other-road traffic accidents”, grouping the following victims: Animal-rider or occupant of animal-drawn vehicle (V80); Occupant of railway train or railway vehicle (V81); Occupant of streetcar (V82); Occupant of special vehicle mainly used on industrial premises (V83) Occupant of special vehicle mainly used in agriculture (V84) Occupant of special construction vehicle (V85), Occupant of special all-terrain or other motor vehicle designed primarily for off-road use (V86); Traffic accident of specified type but victim’s mode of transport unknown (V87) Nontraffic accident of specified type but victim’s mode of transport unknown (V88); Motor- or nonmotor-vehicle accident, type of vehicle unspecified (V89).

Graph 3 illustrates a fundamental reality: motorcyclists, who in 1996 had a negligible mortality rate, became the main RTA victims in 2006.

At the same time, there is a substantial reduction in the Pedestrian mortality rate: while in 1996 this was the second most recurrent type of

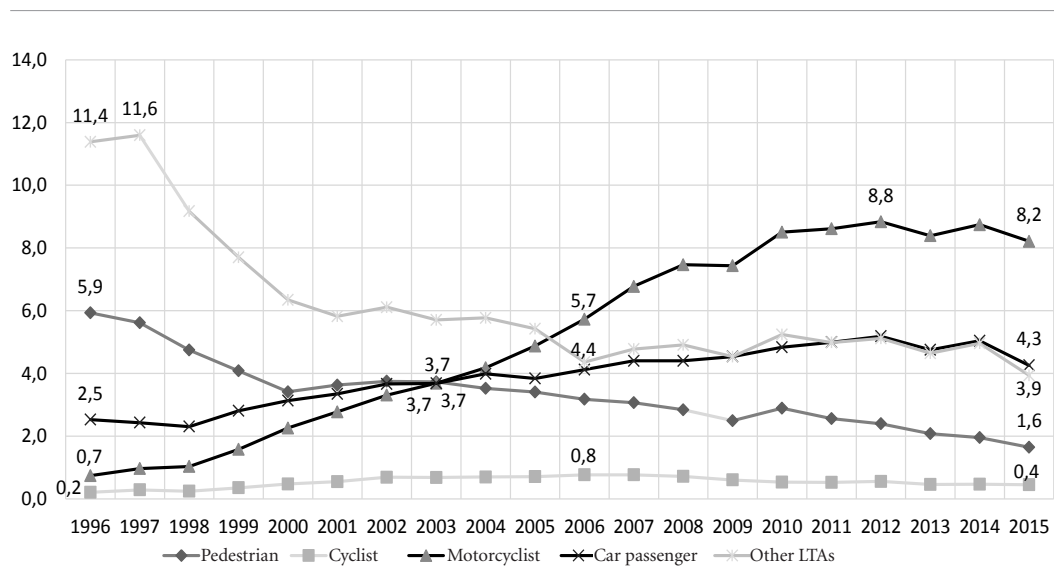
victim, from 2004 onwards it became the fourth, with a consistent and considerable decline.

Also, the victims included in “Others RTA”, which start the period as the most recurrent, show a sharp decline until 2006, ending the period as the third most recurrent, well below its initial level.

Table 1 shows the traffic mortality according to the four main types of victims, organized by age group and gender, showing the inversely proportional relationship among the death risks in traffic by gender: the higher the female age group, the lower the risk; the higher the male age group, the higher the risk.

Thus, mortality by RTA falls predominantly on males. This relationship is even stronger when it focuses on motorcyclists who, since the age of 15, are already 85.5% of the victims, reaching 91% between 20 and 24 years.

Finishing this part, Graph 4, for the period studied, distributes deaths among the four main types of victims by skin color/race. It is noticed that, among adolescents and young people, pedestrians and motorcyclists are mostly black and brown. Among car occupants and other RTA, most dead people are whites.



Graph 3. Brazil - LTA mortality among young people aged 10 to 29 years, according to the main types of victims. (n = 258,335).

Table 1. Brazil. Distribution of deaths due to LTA according to the Type of Victim, Age Group and Gender, 1996 to 2015.

Type of Victim	Age Group															
	10-14 years				15-19 years				20-24 years				25-29 years			
	M	F	Total	%	M	F	Total	%	M	F	Total	%	M	F	Total	%
Pedestrian	5,000	2,248	7,248	31.0	7,762	2,847	10,609	26.8	10,735	2,451	13,186	18.6	11,372	2,280	13,652	16.7
Motorcyclist	807	401	1,208	33.2	14,960	2,532	17,492	14.5	26,843	2,849	29,692	9.6	20,973	2,081	23,054	9.0
Car Passenger	1,725	1,315	3,040	43.3	8,732	3,342	12,074	27.7	16,107	3,860	19,967	19.3	14,785	3,331	18,116	18.4
Other LTAs	3,242	1,661	4,903	33.9	14,796	4,138	18,934	21.9	26,314	4,466	30,780	14.5	23,317	3,698	27,015	13.7
Total	12,250	6,075	18,325	33.2	49,032	13,491	62,523	21.6	83,424	14,246	97,670	14.6	74,122	11,951	86,073	13.9

Source: MS/SVS/CGIAE - Mortality Information System - SIM.

Discussion

Halving traffic deaths by 2020, as outlined in SDG 3.6, is a bold goal. In this context, Brazil emerges as a country in which this type of mortality has impacting rates that have remained stable in the last 20 years.

In the 20 years studied here, an average of about 39,000 people/year died by RTA, of which about 13,200 adolescents and young people. Aimed at SDG 3.6, the implemented public policies should aim to reduce this mortality to something around 19,500/year and, among adolescents and young people, to 6,500/year.

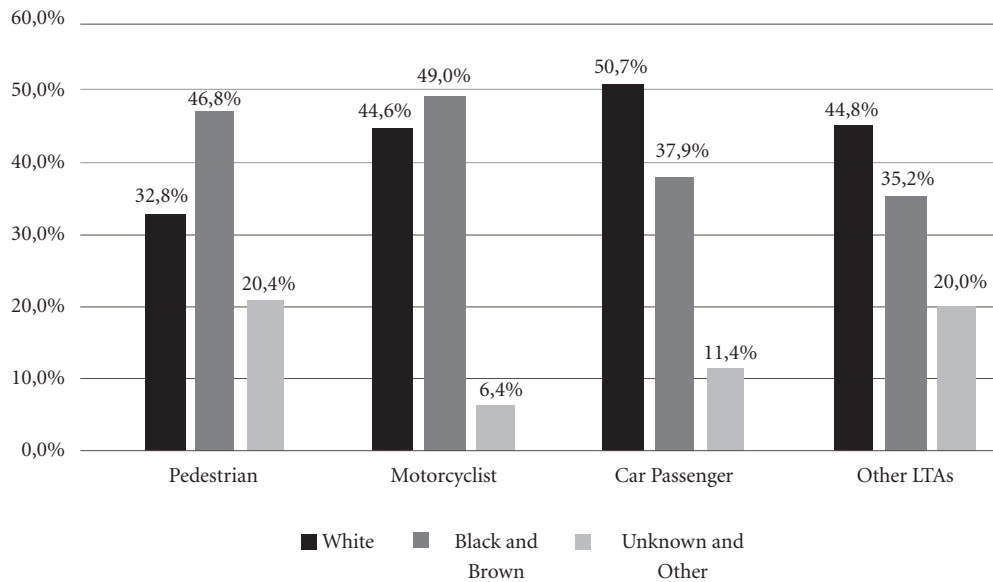
It is a sad fact that even the success of such policies, which is difficult to attain, would still keep mortality at a high level. Perhaps the most socially healthy action for Brazil would be to increase its reduction targets. However, at this moment, the paper focuses on the indication of subsidies to support policies that facilitate the SDG 3.6.

The first point to note is that the establishment of the CTB and more punitive legislation led to a decline in the mortality rate by RTA, especially between 1997 and 2000. However, the rate increased progressively in the following decade²², indicating the limited capacity of this legislation of producing results. We need to know the reasons.

Based on the discussion of several authors^{19,28,29,41}, a national evaluation of the adherence of states and municipalities to comply with Prohibition, its implementation and execution, relating it to local morbimortality data, would indicate gaps, successful experiences and lines which would act as a valuation and improvement of the national legal framework.

The focus on adolescents and young people helps to understand the increased RTA mortality, by evidencing the change in the profile of traffic victims in the post-CTB and Prohibition periods, showing that the primary victims in this age group were male, black and brown motorcyclists. Policies that focus on this audience are priorities.

Such policies must take into account the social relationships that involve this reality: urban mobility patterns that privilege individual transportation; road network with conservation problems; social hierarchization of streets and traffic¹⁰; traffic as an assertion of power and gender bias¹⁴; labor market whose tele-delivery and transportation sector employs black and brown young people with little schooling, but subject them to death risks²³⁻²⁵; worker health and corpo-



Graph 4. Brazil - Proportional mortality by LTA, by Victim Type and Skin color/ethnicity. 1996 to 2015.

Source: MS/SVS/CGIAE - Mortality Information System – SIM.

rate/market accountability for prevention²¹; and pre-hospital care to RTA victims³¹.

Thus, such policies must have intersectoral characteristics, articulating at least protective measures for transit workers; expansion and focus of worker health programs for this audience; intense and constant preventive and educational actions about alcohol and drugs use while driving; programs to fight against gender discrimination; actions to regulate vehicle advertising that exalt aggressive driver behavior; a national road and highway quality policy; and mobilization of civil society for a change in the way people behave in traffic.

It is interesting to note that, according to these recommendations, achieving SDG 3.6 is a process that involves articulation with policies that target other SDG, such as: 5.1 (end all forms

of discrimination against all women and girls everywhere); 8.3 (decent work); 8.5 (full employment for young people); 11.2 (safe transport systems and improved road safety); and 16.1 (significantly reduce all forms of violence and related death rates everywhere).

This means that the interaction of SDGs – implemented through the formulation, implementation, execution and evaluation of public actions, programs and policies – is a strategy that, because it is intrinsically intersectoral, can articulate efforts, reduce costs, integrate human resources, analyze social issues in an articulated way (surpassing the vision of working on each issue in isolation), with the potential to function as a national agenda that guides public policies and, in the case of this paper, to achieve SDG 3.6.

Collaborations

MR Moreira: data collection, drafting, analysis and final review; JM Ribeiro: analysis and final review; CT Motta: data collection, drafting, analysis; JIJ Motta: analysis.

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