International Journal of Drug Policy 97 (2021) 103322

Contents lists available at ScienceDirect

International Journal of Drug Policy

journal homepage: www.elsevier.com/locate/drugpo

Policy Analysis

Analysis of gaps in alcohol policies in Brazil using the *Pan American Health Organization's* Alcohol Policy Scoring

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ARTICLE INFO

Keywords:
Alcohol
Policy analysis
Pan-American Health Organization
Brazil

ABSTRACT

Background: National alcohol policies need to be systematized and evaluated to identify the gaps that should be filled by future laws. This study aims to search for and classify Brazilian public alcohol policies at the federal and state levels, based on the ten Alcohol Policy Scoring (APS) domains used by the Pan American Health Organization (PAHO), to identify any gaps

Methods: Documental research was carried out in two phases: document identification and content analysis. The search included laws, decrees, and ordinances for alcohol referred to in this text as regulatory documents (RD), enacted until December 31, 2019, in Brazil and its 26 states and the Federal District. The APS was used to classify and score the RD, which consists of ten policy domains (including pricing, availability, marketing, and health services), weighted according to the level of scientific evidence of each strategy

Results: We identified and categorized 435 valid RD (21 national laws and 414 state laws). Overall, Brazilian alcohol policies account for 51.6% (255/494) of the APS score. In the pricing policy domain, the second most robust indicator of the APS, the policy gap reached 87% in 25 states, demonstrating a weakness. Only the federal laws against drink-driving include all the recommended dimensions. There are important legislative contradictions in the definition of an alcoholic beverage and in the content of the policies to control marketing

Conclusion: At the national level, the federal government adopted alcohol policies in several of the PAHO policy domains but enacted RD with little practical effect. At the subnational level, despite the autonomy to complement federal laws, the states have not yet addressed the most important gaps.

Introduction

Alcohol consumption is the seventh leading cause of preventable death worldwide, representing at least 3 million deaths per year and the major cause of death among people aged 15 to 49 years (Global Burden of Disease [GBD], 2017; World Health Organization [WHO], 2018).

In 2016, Brazil's average annual consumption was estimated at 7.8L of pure alcohol per capita, higher than the world average of 6.4L and slightly lower than the American continent average of 8L (WHO, 2018). It is estimated that Brazil spends around 7.3% of its annual GDP on alcohol-related problems, from treatment to loss of productivity resulting from alcohol consumption (Gallassi et al., 2008).

Based on the review of scientific evidence of effective interventions to reduce the harmful use of alcohol (Babor et al., 2010), in 2010, the World Health Assembly (WHA) adopted the *Global Strategy to Reduce Harmful Use of Alcohol*, comprised of country-level interventions in ten policy domains: Leadership, Awareness, and Commitment; Health Services' response; Community Action; Drinking-and-Driving policies and Countermeasures; Availability of Alcohol; Marketing of Alcoholic Beverages; Pricing Policies; Reducing the Negative Consequences of Drinking and Alcohol Intoxication; Reducing the Public Health Impact of Illicit Alcohol; and Informally Produced Alcohol and Monitoring and Surveillance (WHO, 2010). Based on this strategy, governments were given clear recommendations on which policies and actions they should invest in and, therefore, could revise their laws or enact new ones and develop

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https://doi.org/10.1016/j.drugpo.2021.103322

a more effective national alcohol policy in reducing their population's morbidity and mortality (PAHO, 2020).

In Brazil, alcohol policies are governed by federal, state, and municipal laws. States have the autonomy to complement federal laws, and the federal government usually follows this model to outsource responsibilities to states that would otherwise be centralized (Government of Brazil, 1988). Brazil is a highly decentralized country, with states (26 states) and municipalities (5,571 municipalities) as autonomous entities. While some measures depend on the approval of the Legislative Power (Federal/state/municipal), others can be adopted based on political decisions or administrative acts of the Executive Power in the three levels of government (Duailibi & Laranjeira, 2007).

An example of this autonomy is State Law No. 15.468 (2007), which restricts alcohol consumption in Paraná's State public transport, but there is no such restriction in other Brazilian states, and this policy does not exist in the federal sphere. In practice, it works as follows: when there is a gap in federal legislation, States can create a law to bridge it. Therefore, as there is no federal law on alcohol consumption in public transport, the states have the autonomy to create their own. However, if a federal law prohibited alcohol consumption in public transport, no State could pass a law legalizing it. Federal law, when it exists, is sovereign (Government of Brazil, 1988).

Considering that there is no gold standard method for constructing composite indicators of alcohol policies, the present study offers a unique opportunity to discuss a possible strategy for classifying alcohol legislation using the Alcohol Policy Scoring (APS), an instrument that is free and easily accessible. The APS was developed by the European Office of the World Health Organization (WHO) and is used in countries in the European Region (WHO, 2018). It was also adapted and used in the Americas Region by the Pan American Organization (PAHO), the WHO's regional office for the Americas (2018). It is based on answers provided by focal points of the Ministries of Health in each Member State to the WHO Global Alcohol and Health Survey (WHO, 2016) and the ATLAS on Substance Use (WHO, 2014). The same method can be used to analyze federal and state (subnational) laws in other countries. Additionally, the use of the instrument can facilitate comparisons with other countries in the Region.

A study by Siegfried & Parry 2019, including 42 systematic reviews on alcohol control interventions, demonstrated that none of them presented data from low or medium-income (LMIC) countries. This reality indicates that, as the policy requires rigorous evidence drawn from local studies and in a context different from the wealthier countries, research on alcohol control in LMICs must be prioritized globally. Therefore, studying alcohol policies in a country like Brazil is of great importance and begins the discussion of the use of APS at a subnational level.

Based on the ten domains of the APS, the objectives of this study are 1) to search for and classify Brazilian federal and State levels alcohol public policies, 2) describe possible gaps at both levels, and 3) identify the capability of States to address national gaps.

Methods

Study design

Documental research (Guba & Lincoln, 1981; Kripka, Scheller, & Bonotto, 2015) was carried out in two phases: document identification and content analysis. In the first phase, document identification was carried out based on the search, identification, and systematization of laws, decrees, and federal ordinances in Brazil, the 26 states, and the Federal District. These are referred to in this text as regulatory documents (RD).

The second phase was based on the concepts of content analysis proposed by Bardin (2011). This consisted of two steps: 1) An RD content analysis (categorical analysis subtype; Bardin, 2011) and classification into the ten WHO policy domains (PAHO, 2018), and 2) a score calculation of alcohol policies, based on the Alcohol Policy Scoring

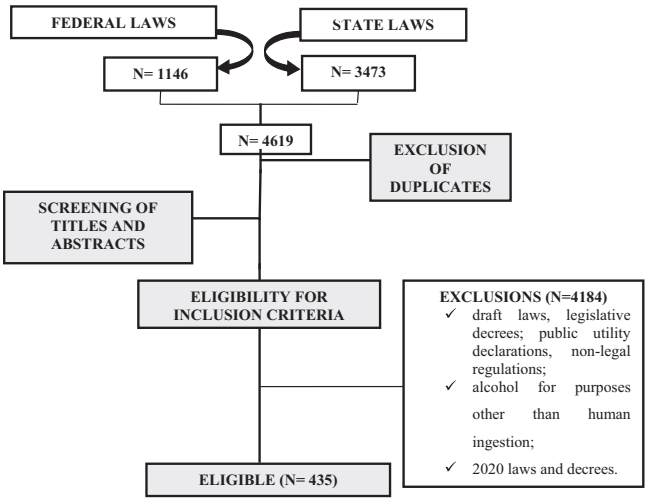

Fig. 1. Search strategy in databases starting in May 2018 until December 31, 2019.

(PAHO, 2018) instrument and a comparison of the results of the scores between the Brazilian states.

Bardin's theory divides the analysis into the following steps: a) floating readings of the RD to come into contact with the material; b) exploratory procedures, employed to allow hypotheses to emerge; c) preparation of the material, breaking up and grouping RD data obtained according to the topics and questions; and d) categorization that allowed highlighting information obtained through simple operations, as an absolute frequency or proportion (Bardin, 2011).

Database search strategy and management

Three authors (CO, CM, and AK) conducted the structured searches on the RD's registration bases, using the search algorithm represented in Fig. 1, with the following descriptors: "alcohol" and "alcoholic beverages." The data were extracted from the official websites of the Federal, State, and Federal District governments (see Supplementary File). To find information on the health system and taxes (domains 2 and 7) that were not retrieved by the regular search, authors GW and ZS performed manual searches on the Ministry of Health and Tax Administration websites.

Initially, the research team selected the RDs identified in the bibliographic search and removed duplicates. Those that did not fit the eligibility criteria were excluded from the evaluation. RDs included in the analysis were federal ordinances, laws, and decrees on alcohol in Brazil, based on laws and decrees enacted and in effect until December 31, 2019, related to alcoholic beverages. The exclusion criteria were RDs concerning alcohol for purposes other than human consumption and draft laws. Considering that data collection took place in early 2020, we only included RD from 2019 or previous years.

Instrument

We used the instrument according to the APS report (PAHO, 2018, 77–87). It consists of 34 summarized and classified indicators in each of the ten policy domains of the Global Strategy (Supplementary File) and can total up to 494 points, weighted according to the level of scientific evidence of each domain (PAHO, 2018). The instrument considers current scientific evidence, and the most effective domains receive higher scores. Thus, the higher the score on each domain, the more the policies in a country are evidence-based. However, the instrument does not

Fig. 2. Percentage of Brazilian federal government response to the ten policy domains of PAHO's Alcohol Policy Scoring to reduce the harmful use of alcohol in the Region of the Americas. Brazil alcohol policies, 2019.

assess the level of implementation of the policy but only the existence of the RD.

Content analysis and quantitative data synthesis

The RDs that met inclusion criteria were read in full and classified in each of the ten policy domains of the APS (PAHO, 2018). The categorization was performed by two authors (CO and CM) and checked by three (GW, ZS, and MM). The discrepancies were resolved by discussion and consensus among the five researchers. Subsequently, the RDs were classified in each of Global Strategy's ten policy domains according to the APS instrument.

The classification was performed for all units of analysis, that is, the 26 Brazilian States, the Federal District, and at the federal level. The final scores were calculated for each unit of analysis on each domain and then compared by the domain separately and as a total final APS value. The APS for Brazil considered federal laws, and the APS for each state was incremental, which means that the points for each state were added to federal policies from the calculation of their state RDs. Thus, in each domain, the states scored at least what Brazil already scored and demonstrated a potential increase. On the domains in which Brazil's score already corresponded to the maximum possible, presenting all the strategies envisaged by PAHO, the states could no longer add scores.

Finally, a comparative analysis by domain and state was carried out to demonstrate the possible deficiencies at the federal and state levels. The Brazilian gaps found in each policy domain were completed using the proportion of the scores obtained by the RD subtracted from the total expected by the APS for each domain. The gaps of the Brazilian states were calculated by adding the score of the state and Brazil, divided by the maximum expected score (PAHO score) of each domain, and subtracted from 100%. The tables illustrate the gaps at the national and state level in each domain of the alcohol policy, according to the APS.

Results

We identified 1,146 enacted federal RDs and 3,473 state RDs, out of which 435 were eligible for the content analysis (Fig. 1). Fig. 2 describes the percentage of the ten domains generated through the scores obtained by Brazilian alcohol policies, based on the APS. Overall, Brazilian national alcohol policies respond to 51.6% of the APS, which means that the country was able to enact laws that respond to a total of 255 points of the 494 points expected by the APS. Notably, the only domain that obtained the maximum APS score and did not require any state supplementation was *Drink-driving Policies*.

Although Brazilian states have the autonomy to implement more restrictive alcohol policies, they did not adequately address the gaps found in the federal law, as they mainly enacted laws that are not in the ten domains of the WHO global alcohol strategy, and therefore not included in the APS. The most significant gaps found at federal and state levels were in the *Pricing Policies, Availability of Alcohol*, and *Marketing of Alcoholic Beverages* domains.

Fig. 2 also illustrates that the most relevant domains, which have the highest weight in the APS, were the least addressed at the federal level: *Pricing Policies* with only 12% and *Availability of Alcohol* with 31.9%.

Within the domain of *Community and Workplace Action*, Brazil has no written policy. Table 1 illustrates that, although at the federal level, Brazil does not have any law that scores within the *Community and Workplace Action* domain, 12 of the 27 states (44%) have approved complementary laws. Rio de Janeiro is the most positive example, as their complementary laws reduced the federal gap to just 27.3%; that is, the sum of the State and federal RD respond, in total, to 72.7% of the score expected. Also, in the *Reducing the Negative Consequences of Drinking and Alcohol Intoxication* domain, only the state of Rio de Janeiro scored and closed the Brazilian gap, while all other states maintained a gap of 37.5%.

In the *Health Services' Response* domain, Brazil met 70% of the PAHO total score. Only the Federal District and Minas Gerais State reduced the gap in federal legislation, but also incompletely (both still have a gap of 20.5%, or nine percentage points lower than the national level and in all other states). The same situation occurred with the *Pricing Policies* domain, in which Tocantins and São Paulo reduced the gap minimally, with both still maintaining a gap of 74.3%, and increasing the score of the federal level and other states by 12.8 percentage points. Brazil offers free and universal public treatment for alcohol use disorders but does not provide all the medications proposed by the APS or special treatment programs for women and children. However, the Federal District and Minas Gerais have, respectively, enacted Federal Laws n. 6.264 (2019) and n. 22.450 (2016) that complement the federal gap in this domain, establishing objective guidelines for the care of women with alcohol and drug problems.

In the *Reducing the Public Health Impact of Illicit Alcohol and Informally Produced Alcohol* domain, which has a federal gap of 80%, only the state of Santa Catarina reduced the gap through state legislation, although a large gap of 60% was still maintained. In the *Marketing of Alcoholic Beverages* and *Monitoring and Surveillance* domains, no state re-

Table 1
Gap (%) in composite indicator–scaled scores according to Alcohol Policy Scoring: WHO Global strategy to reduce the harmful use of alcohol in the Region of the Americas. by Brazilian states, until 2019.

	COMPOSITE INDICATORS GAPS (%) *										
	1	2	3	4	5	6	7	8	9	10*	Total
Brazil	**43.5**	**29.6**	**100.0**	**0.0**	**55.3**	**50.0**	**87.1**	**37.5**	**80.0**	**33.3**	**48.4**
Midwest region											
Goiás	34.8	29.6	100.0	0.0	55.3	50.0	87.1	37.5	80.0	33.3	48.0
Mato Grosso	34.8	29.6	54.6	0.0	48.9	50.0	87.1	37.5	80.0	33.3	44.1
Mato Grosso do Sul	34.8	29.6	81.8	0.0	48.9	50.0	87.1	37.5	80.0	33.3	46.0
Distrito Federal	34.8	20.5	36.4	0.0	39.4	50.0	87.1	37.5	80.0	33.3	41.3
Northeast Region											
Alagoas	43.5	29.6	100.0	0.0	48.9	50.0	87.1	37.5	80.0	33.3	46.6
Bahia	43.5	29.6	81.8	0.0	52.1	50.0	87.1	37.5	80.0	33.3	47.0
Ceará	26.1	29.6	72.7	0.0	55.3	50.0	87.1	37.5	80.0	33.3	46.4
Maranhão	26.1	29.6	100.0	0.0	55.3	50.0	87.1	37.5	80.0	33.3	47.6
Paraíba	34.8	29.6	54.6	0.0	48.9	50.0	87.1	37.5	80.0	33.3	44.1
Pernambuco	34.8	29.6	100.0	0.0	48.9	50.0	87.1	37.5	80.0	33.3	44.3
Piauí	34.8	29.6	100.0	0.0	48.9	50.0	87.1	37.5	80.0	33.3	44.9
Rio Grande do Norte	43.5	29.6	100.0	0.0	55.3	50.0	87.1	37.5	80.0	33.3	48.4
Sergipe	43.5	29.6	54.6	0.0	45.7	50.0	87.1	37.5	80.0	33.3	44.5
North region											
Acre	34.8	29.6	100.0	0.0	50.0	50.0	87.1	37.5	80.0	33.3	46.8
Amapá	34.8	29.6	100.0	0.0	55.3	50.0	87.1	37.5	80.0	33.3	48.0
Amazonas	34.8	29.6	100.0	0.0	45.7	50.0	87.1	37.5	80.0	33.3	46.2
Pará	34.8	29.6	81.8	0.0	55.3	50.0	87.1	37.5	80.0	33.3	47.2
Rondônia	34.8	29.6	100.0	0.0	45.7	50.0	87.1	37.5	80.0	33.3	46.2
Roraima	34.8	29.6	100.0	0.0	52.1	50.0	87.1	37.5	80.0	33.3	47.4
Tocantins	34.8	29.6	100.0	0.0	55.3	50.0	74.3	37.5	80.0	33.3	46.2
Southeast region											
Espírito Santo	34.8	29.6	100.0	0.0	39.4	50.0	87.1	37.5	80.0	33.3	45.3
Minas Gerais	21.7	20.5	100.0	0.0	45.7	50.0	87.1	37.5	80.0	33.3	44.7
Rio de Janeiro	34.8	29.6	27.3	0.0	39.4	50.0	87.1	0.0	80.0	33.3	41.7
São Paulo	34.8	29.6	81.8	0.0	29.8	50.0	74.3	37.5	80.0	33.3	38.1
South region											
Paraná	34.8	29.6	100.0	0.0	39.4	50.0	87.1	37.5	80.0	33.3	41.9
Rio Grande do Sul	34.8	29.6	54.6	0.0	45.7	50.0	87.1	37.5	80.0	33.3	41.7
Santa Catarina	34.8	29.6	72.7	0.0	36.2	50.0	87.1	37.5	60.0	33.3	41.9

*Indicators: 1- Leadership, Awareness and Commitment; 2- Health Services' response; 3- Community Action; 4- Drinking-and-Driving policies and Countermeasures; 5- Availability of Alcohol; 6- Marketing of Alcoholic Beverages; 7- Pricing Policies; 8- Reducing the Negative Consequences of Drinking and Alcohol Intoxication; 9- Reducing the Public Health Impact of Illicit Alcohol and Informally Produced Alcohol; 10- Monitoring and Surveillance.

duced the federal gaps. All states have gaps of 50% and 33.3% in these axes, respectively.

Fig. 3 illustrates the geographic distribution of the APS absolute scores for each Brazilian state. The higher the score, the darker the color on the map, indicating that the state has more laws that reduced the gaps of public alcohol policies in the country. São Paulo and the Federal District best complemented their alcohol policy domains, followed by the states of Rio de Janeiro and Rio Grande do Sul. The states that obtained the lowest score were Amapá, Goiás, and Maranhão, which all had one percentage point. Rio Grande do Norte was the only state that failed to score.

Table 2 describes and quantifies the total number of Brazilian states that scored in each domain. From which the Brazilian states have a lack of laws in three important domains: *Health Services' Response, Marketing of Alcoholic Beverages*, and *Pricing policies.*

Regarding the attempt to reduce gaps in federal laws, states have mainly addressed two domains: *Leadership, Awareness, and Commitment* and *Availability of Alcohol*. Although most Brazilian states invest in the domain of *Leadership, Awareness, and Commitment,* this area has little weight for the total APS score, as opposed to the *Availability of Alcohol* domain.

In addition to the quantitative synthesis presented in the tables and figures, the content analysis of the 435 RDs demonstrated important inconsistencies in Brazilian alcohol policies. The most significant inconsistency was the existence of three national definitions of an alcoholic beverage, all simultaneously in force, despite being contradictory. The 1996 Federal Law No. 9.294, which regulates the advertising of alcoholic beverages, states that beverages with more than 13 degrees Gay-Lussac (GL, a measure of the concentration of ethanol in a liquid that represents 13% of ethanol per volume) are considered alcoholic beverages, thus excluding beer and most wines from the advertising restrictions.

In 2007, the National Policy on Alcohol (Executive Decree No. 6.117, 2007) enacted another definition for an alcoholic beverage, as those that contained 0.5 degrees GL or more. Finally, in 2009, Decree No. 6.871, which regulates Federal Law No. 8.918 (1994), for standardization and inspection, considers alcoholic beverages as those between 0.5% to 54% ethanol in the total volume.

As Federal Law No. 9.294 (1996) also applies to the *Marketing of Alcoholic Beverages* domain, the country has a huge gap here, as it excludes 65% of all alcoholic beverages consumed in Brazil (WHO, 2018).

Another important inconsistency observed is the content of the National Policy on Alcohol (Decree No. 6.117, 2007) and the National Drug Policy (Decree No. 9.761, 2019), which both reinforce the need for prevention and treatment interventions but do not provide means for executing them, nor do they define objective guidelines for doing so, thus not following what is defined in this domain ("1.1 National policy on alcohol: Written national policy on alcohol is accompanied by a national action plan…") by APS (PAHO, 2018, 77).

In relation to the most important alcohol policy domains, such as the *Availability of Alcohol*, we identified the absence of federal RDs to control retail sales and limit hours/days of sales. There are very limited restrictions for the regulation of place of alcohol sales. The state of Pernambuco attempted to complement this domain by passing a law that authorizes the restriction of the hours of sale of alcoholic beverages

Fig. 3. Geographic distribution of the 27 Brazilian states according to the APS relative score for each state.

Table 2
Description of the complement in Score between the Brazilian states.

Composite Indicators	States that have narrowed the country's gaps (N)	States that have narrowed the country's gaps (%)	Minimum - Maximumscore obtained from the 27 states	Number of laws proposed in each axis (min-max) observed in the 27 states	States
1.Leadership, awareness, and commitment	23	85,18%	0 - 5	0 - 13	Acre; Amapá; Amazonas; Ceará; Distrito Federal; Espírito Santo, Goiás; Maranhão; Mato Grosso; Mato Grosso do Sul; Minas Gerais; Pará; Paraíba; Paraná; Pernambuco; Piauí; Rio de Janeiro; Rio Grande do Sul; Rondônia; Roraima; Santa Catarina; São Paulo; Tocantins.
2.Health services' response	2	7,40%	0 - 4	0 - 9	Distrito Federais; Minas Gerais
3.Community and workplace action	12	44,44%	0 - 16	0 - 7	Bahia; Ceará; Distrito Federal; Mato Grosso; Mato Grosso do Sul; Paraíba; Rio de Janeiro; Rio Grande do Sul; Santa Catarina; Santa Catarina; São Paulo; Sergipe.
4.Drink-driving policies and countermeasures	0	0	0	0 - 5	-
5.Availability of alcohol	20	74,07%	0 - 24	0 - 13	Acre; Alagoas; Amazonas; Bahia; Distrito Federal; Espírito Santo; Mato Grosso; Mato Grosso do Sul; Minas Gerais; Paraiba; Paraná; Pernambuco; Piaui; Rio de Janeiro; Rio Grande do Sul; Rondônia; Roraima; Santa Catarina; São Paulo; Sergipe.
6. Marketing of alcoholic beverages	0	0	0	0 - 7	-
7.Pricing policies	2	7,40%	0 - 9	0 - 3	São Paulo; Tocantins
8.Reduction of the negative consequences of drinking and alcohol intoxication	1	3,70%	0 - 6	0 - 5	Rio de Janeiro
9.Reduction of the public health impact of illicit alcohol and informally produced alcohol	1	3,70%	0 - 6	0 - 2	Santa Catarina
10.Monitoring and surveillance	0	0	0	0 - 2	-

in regions with high levels of violence (Federal Law n. 13.020, 2006). However, it does not define either the time or the locations, which leads to the impossibility of enforcing the law.

Another example was the state of São Paulo that enacted Federal Law no. 9.470 (1996) that "prohibits the sale of alcoholic beverages in football stadiums, to reduce violence and its impact on public security," but many of the Brazilian states that were evaluated do not have laws that "restrict sales at specific events," in this case in football stadiums, recommended by item 5.5 of the APS instrument (PAHO, 2018, page 82).

Another important gap was *Pricing Policies*, demonstrating that the increase in taxes on alcohol was minimally contemplated in Brazilian public policies. For this domain, we found only Federal Law n. 13.241 (2015) and Decree n. 8.950 (2016), which establish taxes on industrialized products, including alcoholic beverages. In practice, the highest tax is applied to drinks with high alcohol content, distilled spirits (from 25% to 30% of the rate), and wines (10%). As an example, a bottle (750 ml) of national wine costs USD 5.62 (BRL 30) and will collect 0.56 cents (BRL 3) in tax. In contrast, the beer tax rate is 6%, which is lower than taxes of some basic products, such as shampoos (7%), deodorants (7%), and bricks (8%), as it is classified as a "tax benefit." Among the 27 Brazilian states, none has laws that aim to further increase taxes on distilled and fermented beverages to complement this domain.

In the Drink-driving Policies domain, in 2008, the Federal Law No. 11.705, also known as the "Lei Seca" ("Dry Law") was created and was subsequently improved in 2012, 2014, and 2017, making it more restrictive by imposing a zero-alcohol tolerance on all motor vehicle drivers. Furthermore, it increased the fines and penalties for drivers who break the law, ranging from a driver's license suspension to two to five years of prison, depending on the severity of the violation.

Discussion

Unlike previous studies in other countries that focused only on laws at the national level, this study is the first to systematically identify, classify, and score public alcohol policies in a federal republic in a middle-income country, considering both federal and state-level laws.

A lesson in Brazil's case is that the national and subnational spheres have to be more active in enacting the most cost-effective alcohol public policies. Currently, there is solid scientific evidence to support public policies aimed at controlling alcohol availability, accessibility, and promotion (Siegfried & Parry 2019; Neufeld et al., 2020; Peña et al., 2020) so that states and municipalities could strengthen those policies that are better regulated or enforced locally.

During the period studied, Brazilian states had legislation with little practical effect and did not invest in the most critical domains recommended in the global strategy, a problem that has also occurred in other low and middle-income countries (Matanje Mwagomba et al., 2018). Despite the benefits found in the autonomy of State governments, the deprived socioeconomic regions are the most affected by this model and are exposed to a larger gap on alcohol policies.

There are clear regional differences in the scores regarding Brazilian policies. They are higher in the South and Southeast regions compared to the North and Northeast regions. These differences could be associated with socioeconomic disparities such as imbalances in the Gross Domestic Product per capita, per capita household income, and access to education and health in the regions (Batista; Rocha; Santos, 2020). The North and Northeast are poorer and more unequal and, generally, exhibit lack of adequate public resource management and more corruption (Cássia, 2015). There is evidence that Brazilian policymakers have failed to realize the seriousness of the situation or are not encouraged to face the social problems that need to be solved (Moisés, 2008).

The vast majority of state laws were concentrated on two domains: *Leadership, Awareness and Commitment* and *Availability of Alcohol*. The first domain aims to increase knowledge and awareness about the harm of alcohol consumption and change attitudes related to alcohol and drinking behavior (Janssen et al., 2013). According to Jernigan (2017), 62% of countries globally reported an increase in government policies in this domain in recent years. However, there is almost no evidence of maintained behavior changes using only awareness campaigns (Janssen et al., 2013), demonstrating that these policies are useful only when associated with more effective policies, such as controlling availability and prices (Casswell et al., 1989). Despite this, alcohol education appears to be a popular political measure for governments, as it is easy to publicize through the media (Chisholm et al., 2006; Garretsen & van de Goor, 2004).

In the "Health Services Response," no special treatment programs for women were found. The only pharmacological treatment available for alcohol use disorders with no cost for the patient is the use of benzodiazepines for alcohol withdrawal. A study by Mangueira et al. (2014) demonstrated the need to reformulate public alcohol policies in Brazil aimed at promoting the health of vulnerable groups. While adolescents are considered a priority segment of public alcohol policies in Brazil, women are still treated without priority by such policies, requiring the urgent expansion of the scope of interventions for these populations.

Although Brazil has enacted few evidence-based policies to reduce harmful alcohol use, interestingly, among the five most important policies for the WHO/PAHO, two domains have been well addressed: *Drink-driving Policies* and *Monitoring and Surveillance*. In *Drink-Driving Policies*, laws were created and have been improved upon in the past decade.

The Brazilian drink-driving legislation has become more rigid to reduce traffic accidents and fatalities. Law No. 11.705 of June 19, 2008 (Lei Seca) in Brazil deemed the consumption of alcohol and driving a criminal offense. In 2012, Law No. 12.760 adopted a zero tolerance for alcohol level in the blood for traffic-related offenses. In 2014, Federal Law No. 12.971, and in 2016, the Brazilian Traffic Code were made more stringent with the increase in the value of traffic tickets, and included article 165-A in the chapter of infractions, incorporating the need for alcohol testing to verify driving under the influence. In 2017, Law No. 13.546 was incorporated into the Brazilian Traffic Code. Based on this law, a provision was made for a five-to-eight-year prison sentence for motor vehicle drivers under the influence of alcohol or any other psychoactive substance that causes dependence.

Studies demonstrate an important reduction in traffic mortality rates in the states that have enforced the zero-tolerance drinking and driving laws (Jomar et al., 2019; Andreuccetti et al., 2011), but a new increase followed this reduction when the enforcement was relaxed (Abreu et al., 2018). In 2016, Brazil had the third-highest rate of deaths related to road traffic injuries worldwide, with an estimated mortality rate of 19.7 per 100,000 inhabitants, surpassed only by India and China (WHO, 2018).

In the *Availability of Alcohol*, as there is no federal or state legislation to control retail sales (a specific alcohol licensing system), it is common to observe the sale of alcoholic beverages through informal means such as barbecue carts, candy stands, bakeries, or garages (Basílio & Garcia, 2006). In a scenario with greater control of alcohol availability, it would be possible to determine the quantity, location, and hours of alcohol sales and consumption to improve the control of sales to minors and regulate places and public environments. This could lower the risks of injuries and violent acts from public drinking (Monteiro, 2016).

In *Marketing of alcoholic beverages,* the Federal Law No. 9.294 (1996), which regulates the advertisement of cigarettes and alcoholic beverages, does not consider beer and most wines as alcoholic beverages as their alcohol content is below 13%. This restriction only controls the advertising of alcoholic beverages such as vodkas, whiskeys, among others (most of the beers available on the Brazilian market do not reach 5% alcohol). This means that the advertising of beers and most wines can be run at any time of the day. Additionally, for them, there are no restrictions in associating the product with sport and images or ideas of greater success or sexuality. Moreover, the restriction is only for advertisements carried by standard media (Radio and TV) and does not deal with other forms

of advertising, such as posters, price promotions, sponsorships, or via social media and the internet. Despite these gaps, no state has managed to complement the federal law on the marketing of alcoholic beverages policy.

This legislative vacuum represents a serious omission by the Legislative Power in violation of the Federal Constitution. Self-regulation, in turn, does not fill the legislative omission, although it could serve as a complementary action (Dias, 2011). Law No. 9.294/1996 guarantees the freedom and means of protecting the advertising of these products, and, unfortunately, there has never been a concern about unconstitutionality or establishing effective means of protection in the face of the advertising of harmful products.

Exposure to alcohol marketing is potentially harmful to adolescents, as it influences young people's consumption habits, including early initiation and increased frequency (McCambridge, Mcalaney, & Rowe, 2011). A systematic review conducted by Jernigan et al. (2017) identified twelve studies ranging from nine months to eight years of follow up, involving 35,219 participants from Europe, Asia, and North America, and demonstrated significant associations between exposure and the beginning of alcohol use in young people and clear associations between exposure and binge drinking. These findings were also found in another recent study by Saffer (2020), in which it was also demonstrated that alcohol consumption in young people is affected by alcohol advertising, demonstrating a positive and modest effect on consumption, at least in some contexts.

However, according to Sargent & Babor (2020), it is difficult to estimate the precise relationship between excessive alcohol consumption and marketing due to conflicts of interest of the authors or lack of evidence. However, as most of the studies were conducted in high-income countries, it is possible that stronger effects could be found in low and middle-income countries, where control strategies are weaker, and exposure is increasing.

In the *Price policies* domain, Brazil has tax laws for alcoholic beverages (Federal Law Nº 13.241, 2015; Decree Nº 8.950, 2016), but they are insufficient to reduce affordability. For example, one of the largest alcoholic beverage producers in the country benefits from the concomitant manufacture of soft drinks to reduce taxes on beer. When an alcohol industry also produces soft drinks, they can benefit from tax exemptions offered to all soft drinks producers. There is evidence that, because of this exemption, the federal government lost USD 2.8 billion in taxes from the alcoholic beverage commerce between 2015 and 2018 (Melo, 2019).

Several studies suggest that lower alcohol prices are associated with increased traffic injuries (Kalsi, Selander, & Tervo, 2018), hospitalization rates (Shield, Probst, & Rehm, 2019; Stockwell et al., 2013), adolescent consumption (Noel, 2019), and mortality rates (Sharma, Sinha, & Vandenberg, 2017; Herttua, Mäkelä, & Martikainen, 2015). Purshouse et al. (2010) and Patra et al. (2012) concluded that price policies, especially minimum price and adjustment of taxation level for inflation, are important tools that can promote harm reduction among alcohol drinkers and, therefore, reduce costs to public health and public safety. Brazil still lacks policy reforms, such as a ban on below-cost selling and volume discounts.

According to Brazilian expert opinions, the legislation is favorable to the industry and detrimental to public health (Garcia & Freitas, 2015). Until recently, there were no laws restricting the sale of alcoholic products along the country's main roads, and no policies were adopted referring to availability, such as "licenses to sell alcoholic beverages," as in most developed countries. This leads to wide and indiscriminate product sales networks (Gaya et al., 2014). Another example in pricing policies is that beer in 2015 came under Brazilian tax legislation in the "cold drinks" category, the same as other non-alcoholic drinks, such as isotonics and soft drinks (Garcia & Freitas, 2015).

In *Reducing the negative consequences of drinking and alcohol intoxication,* existing health warnings on beverage labels are ineffective in changing alcohol-related behavior and are not effective in decreasing consumption among heavy drinkers. Additionally, although advertising messages have popular appeal, educational advertising does not have the same resources and frequency in the media as advertising in the alcohol industry (Duailibi & Laranjeira, 2007).

In *Monitoring and surveillance*, although Brazil has an annual survey on the risk factors for noncommunicable diseases, including alcohol use by adults (Brasil, 2019), the data collected do not adequately assess total alcohol use or patterns of use. Rehm and collaborators (2020) suggested that the best measure for predicting harm attributable to alcohol would be through alcohol per capita consumption (APC), which is annually available in almost every country. However, Brazil does not use APC and does not have a National Monitoring System, including data on the social consequences, alcohol policy responses, and alcohol sales. The improvement of this dimension through state laws is essential but was rarely found.

The WHO has set a goal to reduce harmful alcohol use by 10% by 2025, but they predict that member states are unlikely to achieve it, and several countries have mentioned interference from the alcohol industry as an important barrier (Jernigan & Trangenstein, 2020). In recent years, the industry's intense activities included influencing scientific investigations and the public authorities responsible for developing public health policies and legislation (McCambridge; Mialon; Hawkins, 2018). The most worrying aspect of these activities is the strength of the alcohol industry's lobby, making legislation change difficult (Bessa, 2010).

However, investment in alcohol policies has been neglected not only in Brazil. Since 2010, only 21.0% of WHO member states have developed an alcohol policy/strategy, and 34.1% have enacted a policy or strategy. Overall, 34% of member states developed or revised written national policies on alcohol between 2010 and 2015 (Jernigan & Trangenstein, 2020). To reverse this situation, the WHO recently launched the SAFER package, suggesting that member states prioritize five out the ten domains of alcohol policy discussed in this manuscript, namely alcohol availability; countermeasures when drinking-driving; access to screening, brief interventions, and treatment; prohibitions or restrictions on alcohol advertising, sponsorship, and promotion; and raising alcohol prices through excise duties and pricing policies. The SAFER initiative can succeed in places like Brazil and help to protect the formulation of public health-oriented policies against interference from the alcohol industry (PAHO, 2020).

The Brazilian Association of the Beer Industry (CervBrasil), representing the largest manufacturers in the country, reported that the new taxation model favored investments by companies in 2014, producing 14.147 billion liters of alcohol and contributing to 3% of the Brazilian GDP (Reuters, 2015; Garcia & Freitas, 2015). Thus, industries find support to defend their commercial interests, which often conflict with public health (Duailibi & Laranjeira, 2007). One of the main beer manufacturers in the country, Ambev, is also one of the largest investors in advertising (G1, 2017).

According to a global review (no data from Brazil included), the resistance of evidence-based and cost-effective alcohol policy is mainly due to the activities of the actors from the alcohol industry (McCambridge, Mialon, & Hawkins, 2018), causing inertia in public health policymaking (Lesch & McCambridge, 2020). Stakeholder organizations can play a critical role in promoting and helping to maintain effective policies in place by influencing public opinion, demand a policy dialogue and exposing the harmful actions by the alcohol industry (Molnar et al., 2017). There is little scientific evidence on the action of the alcohol industry in Brazil. However, recent comments by Pantani et al. (2020) and Pinsky et al. (2020) have suggested that Brazil's alcohol industry could be influencing price policies, as well as alcohol studies in important research groups.

As this is a documentary analysis, some limitations are observed. First, the review and content analysis of the Brazilian RD's does not allow for inference of motivation of the States to enact the laws or the capacity to implement them. Second, we excluded municipal regulations,

which are quite rich and important, especially in terms of availability of alcohol and health service policies, but due to the extent of Brazil's municipalities (n= 5,570 municipalities), we would have great difficulty in working with all the data. Third, it was not possible to find objectively verifiable evidence on the interference of the alcohol industry and on political interests during the process of formulating public alcohol policies due to the lack of national studies on this subject. Finally, due to the method used, it was not possible to evaluate the implementation of these laws in different territories, even though they are of great relevance. Thus, future research needs to explore the alcohol industry's influence on Brazil's public alcohol policies and assess the implementation and impact of policies at national and subnational levels.

Conclusion

The present study demonstrated considerable gaps in the Brazilian federal RDs for alcohol regulation policies and demonstrated that most States do not effectively complement these policies, even though they can legally do so. Although the gaps have been identified in nine of the ten alcohol policy domains, they seem deeper when looking at the domains considered the most cost-effective according to WHO (PAHO, 2020), including pricing policies, physical availability controls, and marketing comprehensive regulation, thus compromising the potential impact that national and state policies could have on reducing alcohol-attributable morbidity and mortality in Brazil.

Declarations of Interest

The authors are aware of the Journal's conflict of interest policy and have no related activities to disclose. Dr. Maristela G. Monteiro is a staff member of the Pan American Health Organization. The views of this article only reflect her position and do not necessarily reflect the position of the Pan American Health Organization.

Funding

This study was financed in part by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – Brasil (CAPES) – Finance Code 001. Dr. Sanchez has a Productivity Scholarship, granted by the National Council for Scientific and Technological Development (CNPq)/Ministry of Science, Technology, Innovation and Communication (MCTIC): Process No. 308209/2018-4.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.drugpo.2021.103322.

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