Article

Latin America's Digital Media Ecosystem: An Analysis of Prescription Drug Coverage and Diffusion

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Abstract: Many countries ban direct-to-consumer advertising (DTCA) of prescription drugs due to potential health and financial risks. However, the internet and social media now offer new ways for pharmaceutical companies to share information and promote products. Covert marketing—indirectly promoting products through news media—has emerged as an alternative. This study explores the digital news landscape for prescription drugs in Latin America, a region that prohibits DTCA. Through content analysis, it examines prescription drug coverage in both traditional and digital news media published between 1 January 2017 and 1 January 2019, as well as its spread via social media platforms in the region's six largest economies. The findings show that over 62% of news posts lacked neutrality, with articles on new treatments 74% less likely to be neutral, 64% less likely to mention adverse effects, and over eight times more likely to be promotional. Brazilian news had the highest social media sharing rate, with an emphasis on regulatory topics. Overall, digital news in Latin America leans toward promotional content rather than balanced reporting on drug risks and benefits. To support responsible journalism and reduce corporate influence, stronger pharmacovigilance and adherence to professional guidelines prioritizing accuracy, independence, and integrity are needed.

Keywords: news media; social media; prescription drugs; Latin America; covert marketing

1. Introduction

The promotional content of pharmaceutical companies has long been a contentious issue, especially efforts directly targeting the public. Reviews of direct-to-consumer advertising (DTCA) (DeFrank et al. 2020; Franquiz and McGuire 2021) identify, on the one hand, quicker dissemination of new medicines, increased information seeking and requests for appropriate medicines among patients, and possible improvements in patient–prescriber interactions. On the other hand, marketing directly to consumers results in the prescription of inappropriate, harmful, or irrational drugs as well as inadequate medication adherence. Several studies have argued that companies use far more resources on marketing and advertising than research and development (Angelis et al. 2023; Lexchin 2018a; Light and Lexchin 2012). Spending more on DTCA in the US has resulted in higher drug sales but of products with fewer benefits (DiStefano et al. 2023). Most countries ban the direct-to-consumer advertising of medically prescribed drugs due to multiple risks and hazards, including misinformation, over-emphasis on benefits, increased drug costs, and failure to offer other health choices, among others (Parekh and Shrank 2018).

The digital era further complicates questions about pharmaceutical advertising. As consumers increasingly use digital technologies to seek information about symptoms, novel treatments, and general health advice (Jia et al. 2021), drug companies have adapted. In

recent decades, corporate expenditures on internet-based DTCA (or "eDTCA") and their efforts to gain an online presence have increased, while spending on traditional marketing forms (TV, billboards, radio, etc.) have declined (Mackey et al. 2015; Mor et al. 2024). Digital strategies include the creation of disease-specific chat rooms, web-based patient groups, pages dedicated to their products, and sites specific to diseases that are established in order to present unbiased information (Consumers International 2018). The new digital ecosystem has also given rise to patient influencers as important transmitters of health information (Willis et al. 2023; Willis and Delbaere 2022).

While some studies have shown that eDTCA provide benefits by motivating viewers to seek more information from health professionals (Choi and Lee 2007; Fogel and Novick 2009; Mor et al. 2024), the large amount of easily accessible health information also poses risks when inaccurate information is disseminated (Suarez-Lledo and Alvarez-Galvez 2021). For example, corporate websites and DTCA have failed to explain how pharmaceutical interventions operate, offer limited information about costs, and sideline risks associated with a drug (Aikin et al. 2017; Applequist and Ball 2018; Mintzes 2012). In New Zealand, online ads have been associated with increased prescriptions (even when not medically indicated), more adverse side effects, and higher costs for the health system (Every-Palmer et al. 2014). Overall, prescription drug promotion using online media platforms has become more targeted and covert, while the content conveyed is often of low quality, fails to achieve ethical and legal standards, and could be damaging to public health (Mor et al. 2024).

Among high-income countries, only the United States and New Zealand allow pharmaceutical companies to market directly to the public. In the US, the Food and Drug Administration (FDA) regulates advertising and promotional campaigns. Court decisions have further defined and upheld regulatory oversight for accurate and balanced information along with guarantees of free speech (Li and Gibbs 2021). Nevertheless, the regulatory body has struggled to develop adequate guidelines and the capacity to police online content and protect consumers (Ugalde and Homedes 2015). New Zealand's Medicines Act 1981 has allowed for DTCA more by accident than by intention (Every-Palmer et al. 2014), although new regulations are currently being debated. These two countries' policies contrast with the European Union. Directive 2001/83/EC, prohibiting advertisements directly to the public, provides the overarching framework that its member countries implement (Lawrence 2021).

Most Latin American countries allow for advertising of over-the-counter drugs but not medicines requiring a prescription. Like the EU, they have, to varying degrees, incorporated the criteria of the World Health Organization (WHO 1988) regarding ethical promotion into their respective national legislations. The WHO defines ethical criteria for drug promotion as "all informational and persuasive activities by manufacturers and distributors, the effect of which is to induce the prescription, supply, purchase and/or use of medicinal drugs". According to Viña-Pérez and Debesa-García (2017), restrictions on DTCA are based on the view that prescription medicines are not consumer goods but scientific products used for public health objectives and that consumers, as opposed to physicians, are not equipped to identify duplicitous drug claims (see also Betts et al. 2022).

The economic impact of medicines on household budgets and state-funded health expenditures is another concern for low- and middle-income countries, "to the extent that promotion leads to more expensive or less appropriate prescribing, the little money that these countries have for health care is being wasted, and poverty conditions are made even worse" (Lexchin 2021).

Achieving compliance with legal requirements on drug promotion in Latin America remains a challenge (Vacca et al. 2011). The evolving nature of the digital ecosystem complicates efforts to ensure transparent and consumer-friendly messages, achieve rational drug use, and reduce health miscommunication that can lead to mistrust of public health efforts.

Regardless of the more permissive regulations in the US and New Zealand or more prohibitive regulations in the rest of the world, drug companies employ numerous strategies to circumvent restrictions on promotional activities (Angell 2004; Light and Lexchin 2021;

Viña-Pérez and Debesa-García 2017). These include highlighting unauthorized indications for a drug, disseminating material written by ghostwriters, visiting physicians' offices, sponsoring experts at conferences, advertising at congresses, promoting the opinions of medical specialists and opinion leaders, and funding patient advocacy groups.

Despite the documentation of these activities, less is known about online covert marketing tactics (Willis and Delbaere 2022). Especially needed are more studies of online promotional campaigns of prescription drugs that have become more "covert, occurring through unbranded help-seeking campaigns and influencer sponsorship, which may extend the reach and perceived credibility of these messages" (Mor et al. 2024). This is the case for the Latin American region where only a few studies have been completed. While there is a long history of scholarly work about prescription drug advertising and promotion in Latin America (see Homedes and Fugh-Berman 2019; Silverman 1976), there is a need for studies examining embedded marketing—"paid inclusion of branded products or brand identifiers within mass media programming" (Klin and Eshet 2017)—and about strategies through online news reporting and dissemination in the region where DTCA is prohibited.

This study aimed to characterize the Latin American digital news media ecosystem for prescription medicines. The research questions are as follows: To what extent do Latin American media outlets report prescription drug news neutrally? What types of drug news are shared on social media platforms? To answer these questions, we conducted a cross-sectional design content analysis that employs computational and statistical analysis.

2. The Role of Media for the Informed Patient

The news media plays a role in transmitting knowledge to the "informed patient" (Prosser 2010). As an extension of the public sphere, reporting should provide two key tasks in a democratic society: informing the public of important issues and checking power (Lisle 2019). The journalistic ideal is to state the facts, i.e., be objective, and to express these facts with a "neutral tone," or without sensational or inflated sentiment (Panenberg 2020).

Even when there is misleading news or false reporting, as in the case of pharmaceutical claims, the role of the media is to highlight and clarify these discrepancies by reporting the facts. This optimistic perspective portrays new digital information technologies as empowering consumers to be better informed about illness, symptoms, and new and novel therapies (Eysenbach 2001; Petersen et al. 2022). Overall, the ideal is that pharmaceutical news should offer an objective and neutral tone, providing balanced information about risks and benefits and transparent price information.

In contrast with this view, critics of private drug companies argue that their interests and actions negatively impact scientific understanding, transparent health messaging, and the rational use of medicines (Waitzkin 2000). Industry seeks to justify exorbitant profits based on high prices through alleged gains in health; in reality, most new medicines offer limited benefits with significant risks and economic costs (Brody and Light 2011; Lexchin 2018b).

Corporate propaganda, defined as the strategic dissemination of favorable information to shape public opinion, promote product sales, and influence consumer sentiment, plays a key role in achieving companies' financial goals (Bernays 2004). Tactics include emphasizing certain scientific findings as opposed to others, making emotional appeals, leveraging biased expertise, and saturating the public sphere with specific messaging. The subject of health is especially susceptible to the economics of emotion, which seeks to convert attention, through "clickbaiting," and viewing time into revenue (Bakir and McStay 2018)

Given public distrust towards drug companies (Reich 2016), covert and hidden marketing efforts offer a means to influence health communication. Both refer to blurring the distinctions between news and commercial content (Öntaş et al. 2024; Willis and Delbaere 2022). Efforts include contracting ghostwriters to publish favorable scientific results of clinical trials designed to hide risks and demonstrate benefits, paying journalists to write favorable stories about their products, funding patient groups to lobby for their use, seeking to control online commentary, and hiding their affiliations with health organizations

(DeAndrea and Vendemia 2016; Light 2009; Light and Lexchin 2021). In the United States, newspapers allow pharmaceutical companies to post advertisements in a format similar to authentic news (Gellert 2019). Such news reporting raises important public health concerns, as there is rarely any mention of conflicts of interest and reporting remains unbalanced (Cassels et al. 2003; Klin and Eshet 2017; Mena et al. 2022).

Theories and models on information diffusion further extend the insights above and elucidate the role of social media. The "information cascade" approach highlights how individuals follow crowd behavior to quickly disseminate information before fact-checking or verifying the content which leads to information overload or an infodemic (Okoro et al. 2024).Given the prominent role of digital advertising and the corporate dominance of the internet, corporate propaganda has extended itself to social media (Demuyakor 2021; Klaehn et al. 2018). Facebook, for example, operates as a digital marketplace through the commodification of user data and the development of personalized algorithms. Additionally, in an "echo chamber effect" of social media, search engines can fragment discourse to reinforce users' pre-existing views, while emotional appeals—either about risks or benefits—more easily capture attention and can spread rapidly (Okoro et al. 2024).

The advent of Web 2.0 has had a disruptive impact on traditional news reporting. Revenue constraints, pressures to produce content, and the drive to attract headline clicks encourages more covert marketing through reduced journalistic integrity, information diversity, and quality control (Öntaş et al. 2024). Consequently, legacy news must adapt to the new demands of digital advertisers while confronting digital natives of dubious origin that publish sensationalized health content.

3. The Case of Latin America

Latin America provides an interesting case for exploring the online publication and diffusion of pharmaceutical news. The region, generating sales of USD 79 billion in 2020, remains an attractive market for the industry given its 7.4% annual growth in the previous five years (IQVIA 2024). While DTCA mostly remains illegal throughout the region (except for over-the-counter drugs in some countries), marketing and advertising have thoroughly penetrated society and expanded into online venues. As of 2021, the region had 533 million internet users, and South America, as a sub-region, had the highest internet penetration rate, at 75 percent of the population (Bianchi 2024). There has been increasing interest in understanding the role of the internet on health and well-being in Latin America (Pereira Neto and Flynn 2021). For example, previous studies of medicines and the internet in Latin America have demonstrated the importance of massive advertising, including websites and discussion groups, in promoting self-medication, despite the lack of honesty, transparency, and accountability (Gondim et al. 2012; Souza et al. 2008).

Digital news has become an important part of Latin American people's media diets. The past two decades have witnessed a remarkable surge in internet connectivity, catalyzing a profound transformation of the region's media landscape and users' practices. Usage of the internet has risen from 35% of the population in 2010 to 76% in 2021 (World Bank 2021). With a population increasingly connected to the internet, primarily through mobile phones, the region leads global usage for many social platforms. Every month in 2019, 66% of the population in South America and 62% in Central America actively used social media (Kemp 2019). Social media platforms, particularly Facebook and YouTube, have emerged as influential channels for consuming and circulating news, civic engagement, and cultural expression (Newman et al. 2021). However, despite these advancements, digital inequalities persist in the region, with marginalized and rural communities lacking reliable access to the internet, digital services, and digital literacy education (Ziegler et al. 2020).

The Latin American news media digital ecosystem is heterogeneous and has dynamically evolved during the past decades. Despite structural inequalities, the creation of digital media news outlets has led to a diverse and rapidly changing landscape, where the web platforms of established newspapers, radio, and television networks (i.e., legacy media) coexist with digital-born news websites (i.e., digital native media). In a context

characterized by high media ownership concentration and scarce economic resources for independent journalism, the internet has provided opportunities for the emergence of a range of online news initiatives with a variety of business models and approaches (Meléndez 2016; Salaverría et al. 2019; Zuluaga and Gómez 2019). According to a study conducted by Meléndez (2016), most digital native news media in Latin America have a "generalist approach" to journalism, characterized by reporting on many themes, using different formats, and publishing both original content and content produced by other news outlets. Other studies have found that, although many of the Latin American digital-born news outlets have innovated with an investigative journalism approach that focuses on political themes (e.g., corruption, power, human rights, etc.), their use of text-based formats remains traditional (Harlow and Salaverría 2016; Zuluaga and Gómez 2019).

While advertising is the main source of funding for the majority of digital native news outlets, some have diversified their funds by experimenting with donations, international grants, and other forms of collective crowdfunding (Meléndez 2016; Salaverría et al. 2019; Zuluaga and Gómez 2019). For their reach and dissemination, both Latin American digital native and legacy media news outlets have benefited from the popular use of social media, which has allowed for greater immediacy and interactivity in news dissemination, as well as increased competition for audience attention (Newman et al. 2021; Salaverría et al. 2019).

Researchers from universities, non-governmental organizations (NGOs), and the industry, have advanced the study of the Latin American news media digital ecosystem in the last decade. While country- and regional-level studies have examined various aspects of digital news, including political reporting, new media formats, and social reach and impact, health journalism has received less attention (Mioli and Nafría 2017; Salaverría et al. 2019; Zuluaga and Gómez 2019; Newman et al. 2021). This gap in research is evident in terms of the coverage of medications and pharmaceuticals, where factors such as industry influence, regulatory frameworks, and public health implications play significant roles. The issue of how Latin American digital news media outlets report medications remains understudied. We hypothesize that news media accessed via the internet and online social networks may be used as promotional vehicles by pharmaceutical companies and that digital native media will engage in more sensationalized reporting than legacy news.

4. Methods

We conducted a content analysis of online news posts mentioning prescription medicines using computation and statistical tools. To collect data, we used Media Cloud, an open-source platform and toolkit for the computational study of media ecosystems developed by Harvard University's Berkman Klein Center and MIT Media Lab's Center for Civic Media. It has previously been used for research on the networked public sphere in different countries and regions, online media influence, and global health communication (Benkler et al. 2015; Etling et al. 2010; Kaiser et al. 2019; Roberts et al. 2017, 2021).

Media Cloud provides access to an archive of millions of news stories published on the internet by various online media outlets—including mainstream media, blogs, and advocacy groups—from 195 countries and in 17 different languages. Moreover, the platform provides tools for mapping controversies (identifying stories related to a specific topic), mining their content for links to other stories on the open web, and identifying the frequency of Facebook sharing.

Media Cloud tools allowed us to collect news stories about prescription drugs published between 1 January 2017 and 1 January 2019 by online media outlets from the 6 countries with the largest markets in Latin America (Brazil, Mexico, Argentina, Colombia, Peru, and Chile) as measured by their gross national income. Those years were chosen for several reasons, as follows: firstly, the Media Cloud Platform stopped working in 2020, apparently due to issues with data overload and management, and was relaunched in 2023 and, secondly, we wanted to include years that could be similar to prior years and that were not affected by the COVID-19 pandemic. Table 1 describes country averages of per capita income, market size, and number of internet users in 2017–18. Argentina and Chile

have the highest per capita incomes, but Brazil and Mexico were the largest economies with the most internet users during 2017 and 2018.

Table 1. Country characteristics by gross domestic product per capita, gross national income, and number of internet users (average of years 2017–2018).

Country	GDP Per Capita (PPP, Constant 2015 USD)	GNI (PPP Current International USD)	Number of Internet Users (millions)
Argentina	27,986	1,030,206	31
Brazil	17,487	3,011,568	122.5
Chile	28,494	445,930	14.5
Colombia	17,272	704,929	32.5
Mexico	22,291	2,501,575	78.5
Peru	15,091	386,438	21

Sources: World bank indicators and International Communications Union.

Appendix A lists the Media Cloud collections that were queried. For the search queries, we developed a list of the top-selling drugs based on revenue, high-profile drug launches, highest-priced drugs, and most advertised drugs using data from a compilation of news sources.[1] Searches included brand and generic names (e.g., Humira OR adalimumab). The final query used for the search dates 1 January 2017 to 1 January 2019 was as follows:

- "vicodin OR hydrocodone OR neuraptine OR gabapentin OR prinivil OR lisinopril OR biktarvy OR bictegravir OR dupixent OR dupilumab OR ocrevus OR ocrelizumab OR keytruda OR pembrolizumab OR eylea OR aflibercept OR lyrica OR pregabalin OR herceptin OR trastuzumab OR enbrel OR etanercept OR rituxan OR mabThera OR rituximab OR sovaldi OR sofosbuvir OR humira OR adalimumab"

The data query resulted in 2477 stories published by 716 different media sources. After reviewing this initial dataset, the stories were reviewed and those that did not directly discuss prescription drugs or were duplicate entries were eliminated from the corpus.

Next, we conducted a content analysis using each story from the corpus as a unit of analysis (Krippendorff 2019). A team of multilingual investigators (Spanish, Portuguese, and English speakers) and research assistants reviewed the articles of the sample in their entirety, including titles and body of text. Two independent investigators identified themes, trends, and patterns, which were categorized into (1) the type of news media outlet, (2) the media source, and (3) the main issue, along with additional criteria described below.

The types of news media were classified as legacy media (journalist outlets that predate the internet, such as traditional newspapers, magazines, radio, wire services, government sources, and others) or digital native media, which include news with no corresponding print edition and which is delivered exclusively on electronic platforms (such as digital-born news outlets, blogs, etc.).

The media source refers to the author of the post, whether a news organization, government agency, non-governmental organization (NGO), or opinion–editorials (op-eds) that expresses the opinion of an individual or invited columnist. The main issue concerns the content of the report, whether it is primarily about a new treatment on the market, reports about drug misuse or abuse, regulatory issues, health topics in general, prescription drug prices, or business news.

After categorizing the contents into themes, we developed indicators for hidden marketing focused on tone, propaganda, references to adverse drug reactions, and mentions of prices. The coding scheme is derived, in part, from previous studies (Cassels et al. 2003; Öntaş et al. 2024; Prosser and Clayson 2008; Tyrawski and DeAndrea 2015). To determine article tone, or the "economy of emotions," we employ a simplified sentiment analysis of positive, neutral, and negative (Boukes et al. 2020). A "positive" code denotes a positive framing of prescription drugs as good or praiseworthy in a normative sense; a "negative" code refers to critical or unfavorable news depictions; and "neutral" determines neither positive or negative framing or a balanced mix of the two. If the news media follows the

journalistic ideal, then we would expect most news reports to score as neutral. Otherwise, the majority would be non-neutral.

Propaganda refers to information presented in a promotional nature and which is used to further a cause (drug, company) or point of view (e.g., benefits). We adapt the coding of Tyrawski and DeAndrea (2015), where "yes" indicates that the article expresses or implies support for the company or its products, "no" means the article displays opposition to the company and its products, and a coding of "maybe" denotes somewhat support or mix of support and opposition.

We expect the news reports that are neutral in tone not to be propagandistic. Adverse drug reactions are the negative side effects of taking prescription medicines. We hypothesize that news media about new treatments would not mention ADRs, would appear as propaganda, and would fail to mention price.

Data entry errors, duplicate entries, or missing data were addressed before the analysis by going back to the source and confirming the entry. From an Excel spreadsheet, data were imported to IBM SPSS for Windows, version 29 (IBM Corp., Armonk, NY, USA) for analysis.

Proportions of news media categories by article tone were calculated with cross-tabulation.

To identify associations, binary logistic regressions were conducted for each of the independent variables individually, including language, media type, media source of information, main issue covered, and propaganda. The dependent variable was "neutral tone," coded as "neutral" = 1, and "non-neutral" = 0, which included both negative and positive tones. Unadjusted odds ratios with 95% confidence intervals were calculated. (Supplementary materials provide details of the statistical outputs).

To describe the posts shared on Facebook, we categorized a variable as 0 = not shared and 1 = shared once or more, the variable was then used as the dependent variable. We constructed binary logistic regressions and included each of the descriptive variables in separate models to assess whether the posts that were not shared were any different than those who were shared.

5. Results

Manual and automated filtering resulted in a final data set of 407 news stories published by 186 media outlets. The reliability tests (intercoder reliability) performed on each variable reached scores between 89% and 95% (0.89–0.95 Cohen's kappa) in 100 database entries. Table 2 provides an overview of the descriptive statistics of the corpus and the results of content analysis by tone.

Among six countries in Latin America, the news included in the corpus were distributed unevenly, as follows: Mexico 45.2% (*n* = 184 entries), followed by Brazil, 23.1% (*n* = 94); Argentina, 16.7% (*n* = 68); Peru 7.1% (*n* = 29); Chile, 5.7% (*n* = 23); and Colombia 2.2% (*n* = 9). As a consequence, the majority of news in the corpus (313) are in the Spanish language (76.9%), while only 94 are in Portuguese (23.1%). The proportion of news media articles about prescription medicines in Spanish was 76.9%, relative to Portuguese at 23.1%; news media using a neutral tone was only 37.8%, relative to positive tone use at 36.9% and negative tone at 25.3%. Legacy and digital native media types were 48.9% and 51.1%, respectively. A limited number of news media originated from the government or a non-profit organization, 2.5%, or from opinion–editorials, 2.0%. News media composed most of the corpus, at 95.6%. New treatment and drug misuse or abuse reports were the most frequent topics discussed, at 37.1% and 24.1%, respectively.

Table 2. Descriptive characteristics of the corpus entries by neutral, positive or negative tone.

	Neutral *n* = 154 (37.8%%)	Positive *n* = 150 (36.9%)	Negative *n* = 103 (25.3%)	Total *n* = 407 (100%)
		Language		
Spanish	119 (38.0%)	110 (35.1%)	84 (26.8%)	313 (76.9%)
Portuguese	35 (37.2%)	40 (42.6%)	19 (20.2%)	94 (23.1%)
		Media Type		
Legacy news	72 (36.2%)	76 (38.2%)	51 (25.6%)	199 (48.9%)
Digital native	82 (39.4%)	74 (35.6%)	52 (25.0%)	208 (51.1%)
		Media Source		
News organization	145 (37.3%)	143 (36.8%)	101 (26.0%)	389 (95.6%)
Opinion–editorials	2 (25%)	6 (75.0%)	0 (0.0%)	8 (2.0%)
Government/NGO	7 (70%)	0 (0%)	0 (0.0%)	10 (2.5%)
		Issue		
New treatment	30 (19.9%)	106 (70.2%)	15 (9.9%)	151 (37.1%)
Drug misuse or abuse	56 (57.1%)	6 (6.1%)	36 (36.7%)	98 (24.1%)
Regulatory issues	21 (36.2%)	12 (20.7%)	25 (43.1%)	58 (14.3%)
Health in general	30 (51.7%)	16 (27.6%)	12 (20.7%)	58 (14.3%)
Price	10 (33.3%)	8 (26.7%)	12 (40.0%)	30 (7.4%)
Business news	7 (58.3%)	2 (16.7%)	3 (25.0%)	12 (2.9%)

Table 3 describes the proportion of news articles that discussed new treatments classified as propaganda, whether they listed adverse reactions (ADRs), and treatment costs. The percentage of reports that were in a neutral tone was 19.9% compared with positive and negative tones, at 70.2% and 9.9%, respectively. New treatment articles classified as propaganda comprised 39.7% when compared with non-propaganda (41.1%) and potential propaganda (19.2%). Twenty-two articles (or 14.6%) about new treatments mentioned ADRs and 129 (or 85.4%) did not. Prices were mentioned in 31.6%, while in 68.4% they were not.

Table 3. Descriptive characteristics of news reports about new treatments.

Scope of New Treatment, Count and Percent of Total (*n* = 151)	
Neutral tone	30 (19.9%)
Positive tone	106 (70.2%)
Negative tone	15 (9.9%)
Propaganda, yes	60 (39.7%)
Propaganda, no	62 (41.1%)
Propaganda, uncertain	29 (19.2%)
ADRs mentioned	22 (14.6%)
ADRs not mentioned	129 (85.4%)
Prices included	27 (31.6%)
Prices not included	117 (68.4%)

Table 4 lists the results of logistic regression models that evaluate the associations between neutral tone (vs. non-neutral) and diverse news media characteristics. Comparisons between media type (legacy vs. digital native media) in relation to neutral tone were not statistically significant, odds ratio (OR) = 0.87; 95% CI (0.58–1.30); however those sourced by the government (vs. other) were almost 4 times more likely to be neutral, OR = 3.97; 95% CI (1.01–15.58).

Table 4. Binary logistic regressions for neutral tone relative to news source, issue, and propaganda.

	OR	95% Confidence Interval		Sig.
		Language		
Spanish	1.03	0.64–1.67		0.891
Portuguese	0.97	0.60–1.56		0.891
		Media Type		
Legacy media	0.87	0.58–1.30		0.500
Digital native	1.15	0.77–1.72		0.500
		Source of Information		
News media	0.51	0.17–1.55		0.233
Opinion–editorials	0.54	0.11–2.72		0.457
Government or NGO	3.97 *	1.01–15.58 *		0.048 *
		Issue		
New treatment	0.26	0.17–0.42		<0.001
Drug misuse or abuse	2.87	1.80–4.58		<0.001
Health	1.94	1.11–3.40		0.020
Regulatory	0.92	0.52–1.64		0.782
Price	0.81	0.37–1.78		0.598
Business news	2.36	0.74–7.58		0.148
		Propaganda		
Not propaganda	7.36	4.09–13.25		<0.001
Yes or potentially propaganda	0.14	0.08–0.24		<0.001

* Reference category

More importantly, bias was observed in articles that were classified as "likely to be propaganda," which were 86% less likely to have a neutral tone relative to those classified not as propaganda, OR = 0.14; 95% CI (0.08–0.24).

We further characterized new treatment reports, as we hypothesized that new treatment news posts were more likely to be associated with having a non-neutral tone, and to avoid including adverse reactions or cost. The odds of new treatment reports being neutral were 74% lower, relative to all other issues [OR = 0.26; 95% CI (0.17–0.42), $p < 0.001$]. New treatment posts also exhibited 64% lower odds relative to other news posts of including adverse reactions [OR = 0.36, 95% CI (0.21–0.61), $p < 0.001$]. Additionally, they were 8.24 times more likely to be propaganda, [OR = 8.24; 95% CI (5.13–13.22), $p < 0.001$]. This suggests that news of new treatment reports is biased, i.e., is less likely to include adverse reactions and to be propagandistic.

In terms of price, we did not observe a significant association between new treatment posts and price reporting in the news post, OR = 0.95; 95% CI (0.56–1.60).

Interestingly, the odds of drug misuse or abuse articles being neutral was 2.87 times greater, relative to all other issues, OR = 2.87; 95% CI (1.80–4.58), $p < 0.001$. Additionally, the odds for news reports about general health information being neutral was 1.94 greater relative to other posts; [OR = 1.94; 95% CI (1.11–3.40), $p < 0.001$].

Comparisons between digital native/legacy media and the inclusion of adverse reactions or propaganda were not significant, OR = 0.72; 95% CI (0.47–1.14), $p = 0.163$ and OR = 0.65; 95% CI (0.40–1.07), $p = 0.089$, respectively.

Table 5 details the 208 articles from the corpus that were shared on Facebook at least once. Of these, most were in Spanish (65.9%), derived from digital native outlets (52.9%), were penned by news organizations (96.2%), and were not considered propaganda (77.4%).

Content about new treatment was the leading issue shared (35.6%), followed by reports about abuse and misuse (23.6%). Articles with a neutral tone were shared the most (42.3%) followed by those that were positive and negative, at 34.6% and 23.1%, respectively.

There were 35 stories with more than 100 shares. The majority were in Portuguese (54.3%), derived from digital native sites (51.4%), were penned by news organizations (97.1%), focused on new treatments (57.1%), were not propaganda (51.4%), and had a positive tone (54.3%). Seven articles were shared between 1000 and 10,000 times. Five of these concern new treatments and only two mention ADRs. The most-shared article, over

14,000 times, was about an individual whose gray hair began turning dark after using a new cancer treatment. It was published by legacy media, classified as propaganda, with a positive tone, and mentioned ADRs.

Table 5. Characterization of news articles shared on Facebook.

	Articles Shared on Facebook (*n* = 208)	Percentage (%)	OR (95% CI)	*p*-Value
Language				
Spanish	137	65.9%	0.24 (0.14–0.41)	<0.001
Portuguese	71	34.1%	4.15 (2.45–7.03)	<0.001
Media Type Outlet				
Legacy media	98	47.1%	0.87 (0.59–1.29)	0.495
Digital native	110	52.9%	1.15 (0.78–1.69)	0.495
Media Source				
News media	200	96.2%	1.19 (0.45–3.15)	0.725
Government/NGO	6	2.9%	1.44 (0.40–5.18)	0.576
Op-Ed	2	1.0%	0.38 (0.07–1.95)	0.244
Main Issue				
New treatment	74	35.6%	0.89 (0.59–1.33)	0.558
Abuse and misuse	49	23.6%	0.94 (0.60–1.48)	0.779
Regulation	37	17.8%	1.82 (1.03–3.24)	0.041
Health	28	13.5%	0.87 (0.50–1.52)	0.627
Price	12	5.8%	0.61 (0.29–1.31)	0.205
Business news	8	3.8%	1.94 (0.58–6.55)	0.286
Propaganda				
Yes or maybe	127	31.2%	1.12 (0.74–1.71)	0.599
No	280	68.8%	0.89 (0.59–1.36)	0.599
Article Tone				
Negative	48	23.1%	0.78 (0.50–1.22)	0.277
Positive	72	34.6%	0.83 (0.56–1.25)	0.372
Neutral	88	42.3%	1.47 (0.98–2.20)	0.063

Contrary to our expectations, we observed no associations between digital media, new treatments, propaganda, and emotive posts. Instead, we found that news in Portuguese had more than four times the chance of being shared versus Spanish posts [OR 4.15 (2.45–7.03) *p* < 0.001], revealing that the content produced by Brazilian news organizations, particularly about new treatments, had more of a diffusion on social media. Additionally, news about regulatory issues had nearly double the likelihood of being shared when compared with other news topics [OR 1.82 (1.03–3.24) *p* < 0.041].

6. Discussion

This study aimed to characterize whether pharmaceutical news media in the six largest economies in Latin America abide by the journalistic ideals of objective, non-biased reporting or exhibit hidden marketing. The analysis found that over 62% of total news posts related to prescription drugs did not have a neutral tone, suggesting more of the latter. Covert marketing appears even more prevalent in posts about new treatments. These were 74% less likely to be neutral, or 64% less likely to include adverse reactions, and 8 times

more likely to be classified as "propaganda". On the contrary, news from government sources were almost 4 times more likely to be neutral, suggesting that official sources may offer less biased information in this specific context. These findings follow past and recent trends of news coverage that skews towards promotional content, as compared with information designed to limit prescription medicine use (Klin and Eshet 2017; Prosser and Clayson 2008).

Covert marketing in Latin America—whether in legacy or digital native news sources—may be more common than in other parts of the world where direct to consumer marketing is prohibited. Our results show even higher rates than those of a study of the Turkish media that identified a proportion of promotion of 16.3% that was hidden in health-related content regarding drug treatments, with only about one-third of reports mentioning negative side effects (Öntaş et al. 2024). Similarly, the analysis by Cassels et al. (2003) of new drug launches in the Canadian press revealed less than a third of the articles mentioned a possible side effect or harm.

In Latin America, problematic marketing may be more widespread, despite formal prohibitions against direct-to-consumer advertising (Vacca et al. 2011). A study of Ecuadorian television newscasts, i.e., the transmission of "official news" that employs advertising content to help fund programming, found that 90% of the ads for health-related products were misleading (Mena et al. 2022). Much of the Latin American news ecosystem fails to fulfill the journalistic ideal of neutral, balanced reporting.

While others have found social media that is used to promote drug benefits while de-emphasizing risks (Aikin et al. 2017; Pedral and Luz 2022), the present study could not confirm that this is the case for Latin American news coverage. Instead, for the specific drugs assessed in the present study, Facebook shares were found to be more frequent in the Brazilian digital ecosystem when compared with Spanish-speaking countries.

Interestingly, a dissemination of reports that focused mostly on reports on regulatory issues and pricing policies was also more frequently observed. Digital diffusion through social media appears to reflect the content originally posted by media organizations, although we did observe the proportion of new treatment increase at higher cut-offs of sharing (i.e., shared more than 100 and 1000 times). The percentage of emotion-laden and propaganda content also rose at these higher sharing rates. Here, social media influencers may be playing a role (Willis et al. 2023; Willis and Delbaere 2022).

Our findings contribute to the calls to better regulate news reporting and social media in order to disseminate balanced information about drug use, especially related to risk and benefit information (Greene and Kesselheim 2010; Kim 2015). Third-party oversight and industry self-regulation will likely play an important (Gibson 2014), but insufficient role, as in the case of banner ads online (Adams 2016) and pharmaceutical websites providing incomplete risk information (Davis et al. 2007). Efforts should include targeted health campaigns, improving information literacy, and seals of quality approval by independent health professionals (Mendonça and Pereira Neto 2015; Okoro et al. 2024). Countries should also increase well-trained pharmacovigilance personnel and inter-agency collaboration as well as improve education on drug marketing among healthcare professionals (Mena et al. 2022).

Future studies should analyze the effects of initiatives that follow the World Health Organization's ethical criteria for drug promotion on patient outcomes, health system expenditures, adverse reactions, and provider–patient interactions (Fulone et al. 2023).

This study has multiple strengths. To our knowledge, it is the first to analyze news media about prescription medicines using a systematic approach in a wide range of geographic contexts in Latin America and with multiple quality checks. This study offers important information to professional bodies and policy makers for improving transparency and balance in the dissemination of health information.

Limitations of this study include the accessibility of media outlets in the Media Cloud's collection for scraping news. We do not know, exactly, which of those media outlets had barriers and firewalls during the period we analyzed. Some collections may have inadvertently

excluded some media outlets of a country. Second, the social media analysis was specific to Facebook, which may introduce some bias as younger populations are known to be less active on such platforms versus others, e.g., Instagram and TikTok. Additionally, social media companies no longer share data with researchers and factcheckers about digital interactions. During and after the COVID-19 pandemic, these platforms increased the censorship and moderation of medical-related content, particularly about vaccines, but we do not know to which extent this was implemented in Latin America (Gomez Wagner 2022). Third, our study sample occurred during the 2017–2018 period, when substance abuse issues by celebrities attracted significant media attention (e.g., Tiger Woods). Sampling a different period may bias the reporting of events of high-profile cases.

Another limitation is that we tested multiple hypotheses, but we included all *p*-values and confidence intervals that will allow for the readers' interpretation. Further research is needed to assess the characteristics of news articles that are shared multiple times, include other drugs such as those used for esthetic purposes, and fact-check the posts to assess veracity and scientific accuracy.

7. Conclusions

Latin American news often features non-neutral, propagandistic coverage of drugs, with a significant focus on new treatments that are presented in a positive light and with less attention to adverse reactions. This highlights a broader trend of promotional content overshadowing transparent, balanced information about risks, benefits and alternatives. The regulatory landscape in this sphere appears insufficient, with industry self-regulation and pharmacovigilance lacking. The Association of Health Care Journalists provides a comprehensive statement of principles to uphold professionalism, accuracy, independence, and integrity that can inform oversight and policy. Adoption of these guidelines could address challenges in the Latin American news media ecosystem, where the dissemination of accurate drug information remains crucial. Both legacy and digital native media outlets in the region need to uphold ethical standards and improve information quality to foster trust and public health.

Appendix A

Below is the list of collections queried on Media Cloud.*

Argentina
National collection #34412043 ● Public ● Dynamic: 1940 media sources.
State and local collection #38376412 ● Public ● Dynamic: 1819 media sources.

Brazil
National collection #34412257 ● Public ● Dynamic: 79 media sources.

State and Local collection #38379250 ● Public ● Dynamic: 1429 media sources.

Chile
National-Collection #34412295 ● Public ● Dynamic: 170 media sources

Colombia:
National Collection #34412358 ● Public ● Dynamic: 124 media sources
State and Local Collection #38379514 ● Public ● Dynamic: 43 media sources

Mexico**
National collection #34412427 ● Public ● Dynamic: 676 media sources.
State and local collection #38380322 ● Public ● Dynamic: 479 media sources.

Peru**
National collection #34412158 ● Public ● Dynamic: 107 media sources.
State and local collection #38380582 ● Public ● Dynamic: 53 media sources.

*Media Cloud collections change year to year and can increase or decrease. Access to the platform requires an account.

**The national collections for Mexico and Peru included World News | Reuters.com and created lots of noise in the search. We requested the Media Cloud team to remove the source before conducting our search query.

Note

[1] Top selling drugs for 2017–18 (i.e., Humira, Eylea, Rituxan, Enbrel, Herceptin, Lyrica, and Sovalidi) that appear more than once on the lists from GEN News (https://www.genengnews.com/a-lists/the-top-15-best-selling-drugs-of-2017/; accessed on 1 February 2020), Biospace https://www.biospace.com/article/drumroll-please-top-10-bestselling-drugs-in-the-u-s-/; accessed on 1 February 2020) and FiercePharma (https://www.fiercepharma.com/special-report/top-20-drugs-by-2018-u-s-sales; accessed on 1 February 2020); high-profile drug launches for 2017–2018 (i.e., ocrevus, bictegravir, dupixent) reported by FiercePharma (https://www.fiercepharma.com/special-report/top-10-drug-launches-2017; accessed on 1 February 2020) and Endpoints News (https://endpts.com/the-top-10-prospective-blockbuster-drug-launches-slated-for-2018-evaluate/; accessed on 1 February 2020); most advertised drugs (i.e., Humira, Lyrica, and Keytruda) from BioPharma Dive (https://www.biopharmadive.com/news/drug-ads-tv-pharma-changing-face-dtc-advertising/539982/; accessed on 1 February 2020) and Kaiser Health (https://khn.org/news/price-check-on-drug-ads-would-revealing-costs-help-patients-control-spending/; accessed on 1 February 2020); and frequently prescribed drugs (i.e., Hydrocodone, Lisinopril, Gabapentin) listed by Business Insider (https://www.businessinsider.com/common-popular-prescription-drugs-us-2017-7; accessed on 1 February 2020) and Aplus USA Pharma (https://www.aplususapharma.com/blog/americas-most-prescribed-drugs-in-2018/; accessed on 1 February 2020).

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