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Tobacco advertising and press coverage of smoking and health in 10 years of Argentinean newspapers

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Summary

Objective: To describe the extent and content of tobacco-related images, advertising and articles published in the largest Argentinean newspapers before and after a voluntary advertising ban implemented in 2001.

Methods: Issues from four months of each year of the four main national newspapers were examined from 1995 to 2004. We recorded the number of tobacco images (advertisement or not), tobacco-focused articles, space used, and placement within the newspaper. Regression analyses evaluated time trends.

Results: We identified 1800 images and articles from 4828 different issues. Non-advertisement images were the most frequent (71.2%), followed by articles (20%) and advertisement images (8.8%). Advertisements only appeared in the two best selling newspapers with a majority (57%) in the Sunday magazine and 21% in the sports sections. Non-advertisement images were published in the sports and entertainment sections (55%) and showed a public figure in 88%. Of 336 articles, 39% focused on health topics and 55% emphasized the negative effects of tobacco on health. Regression models showed that prior to 2001 there were significant time-related decreases in ad images and articles and significant increases in non-ad images. The trend of each outcome changed direction beginning in 2001 and the magnitude of the change in trend was significant for ad images and non-ad images. The number of non-ad images dropped signif-

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icantly in 2001 from a model-predicted value of 178 per year to 103 non-ad images and remained constant thereafter.

Conclusions: Tobacco images exceeded information about tobacco hazards in Argentinean newspapers over this period. Advertisement increased from 2001 to 2005, following the voluntary advertisements ban. Partial advertisement bans are ineffective and a total ban is imperative.

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Introduction

In 2001, Nobleza Piccardo, the Argentinean subsidiary of British American Tobacco, stated that "Argentina remains a relatively "smoker friendly" environment in comparison to many others markets". The industry had planned to begin activities in anticipation of increasing anti-smoking pressure, naming them "a preparation of a possible "dark scenario" [1]. Therefore, it is not surprising that Argentina has one of the highest smoking prevalence rates in Latin America having reached 33.4% in the population between 18 and 64 years of age with 38.4% of men and 28.6% of women [2] The prevalence of smoking among adolescents 13–15 years old is also high at 24.5% [3].

Despite evidence that only a complete advertising ban reduces tobacco consumption [4], Argentina lacks a comprehensive national ban on tobacco advertising. Several studies based on tobacco industry internal documents have shown how they have successfully lobbied against advertising restrictions [5–7]. In 1997 the tobacco industry created a weak voluntary self-regulating code to avoid stronger legislated restrictions on advertising. Since the 1986 legislation (Law number 23,344) tobacco advertisements were aired on radio and television from 10 pm to 8 am only although indirect advertisement was not regulated [8]. The tobacco industry voluntarily withdrew all advertisements from the electronic media in 2000, and as a consequence, the print media became the main venue for tobacco advertising.

The print media have been shown to influence popular attitudes and behavior about smoking [9]. In addition, the mass media can influence population smoking either through tobacco industry advertising that promotes the behavior or public health anti-tobacco messages that discourage it [10]. Tobacco advertising undoubtedly contributes to the multiple and convergent psychosocial influences that lead youth to smoke [11,12] and this fact is observed in diverse cultures and persists when other risks factors are controlled for [11].

The tobacco industry also appeals to targeted population sectors through different settings such as events involving sports, the arts, fashion shows, and movies using subliminal messages [13] or indirect advertisements. Thus a complete assessment of tobacco industry marketing strategies must include both direct and indirect advertising.

Contrary to the influence of paid advertisements, suitable news coverage of tobacco issues in the print media can be effective and positive for tobacco control objectives. Media advocacy plays a critical role in promoting public health goals through the strategic use of the news media and is increasingly seen as a key component of comprehensive tobacco control programs. Media advocacy is not only important in setting the agenda for policy change, but

may also increase news coverage of tobacco issues and help reduce cigarettes sales as well increase smoking cessation rates [10,14,15].

In Argentina, there is insufficient information about tobacco industry advertising reach and frequency, target audience, and the use of indirect ads. There is also limited information on press coverage of the hazards of smoking as a potential strategy to promote tobacco control. We sought to understand the strategies used by industry with the ultimate goal of developing better media advocacy to counter these strategies. The objective of this study was to systematically examine the extent and content of tobacco images and articles published in the most popular Argentinean newspapers from 1995 to 2004.

Methods

This is a longitudinal study with a time-trend analysis in an interrupted time series to evaluate and compare the content and extent of tobacco images and tobacco-focused articles published in the largest Argentinean newspapers from 1995 to 2004. We selected this time period in order to evaluate the effect of the voluntary advertising restriction on electronic media implemented by the tobacco industry. Most of the newspaper issues were obtained from the Argentinean National Newspaper Library, the Legislature of Buenos Aires City Library and the Argentinean National Congress Newspaper Library by a team of six reviewers. Additionally, in order to complete the search, selected issues were obtained in the public archives of each newspaper.

Identification of tobacco articles

In order to guide the identification of the tobacco-focused articles, we first searched on the Internet, using "tobacco", "cigarettes" and "smoking" as key words [14–17]. Tobacco images were classified as an advertisement when these contained the image of a commercial product [18] with an identified brand used by tobacco industry to promote the purchase of these products, or in others words "the classic tobacco ad". Tobacco images were classified as non-advertisement images when they were related to tobacco but lacked explicit promotion of an identifiable commercial product [18], for example, any image that contained an identified brand (typically a Formula 1 image) or any image that contained the main character smoking cigarettes or cigars without identifying any brand. Tobacco-focused articles were defined as any newspaper article reporting on tobacco as its main topic with more than half of the paragraphs about tobacco and subsequently categorized by a coding scheme [9,15,16].

Newspaper selection

We selected the four national Argentinean newspapers with the largest circulation: *Clarín*, *La Nación*, *Página 12* and *Crónica*. The circulation rate was selected as an inclusion criterion because it is an objective measure of the number of people potentially exposed [19], and data on circulation were derived from a non-governmental organization, *Instituto Verificador de Circulaciones* (IVC) and each newspaper. The full count of published newspaper issues during the study period was 14,440 (sample frame), but without having data about expected prevalence of tobacco images or tobacco-focused articles, we assumed that $p = 50\%$ as the expected proportion recommended for precision estimates [20]. Thus we aimed to sample 4801 newspaper issues, providing a 95% confidence coefficient with estimated precision equal to $\pm 0.14\%$. A systematic sample was taken by selecting the starting point at random. We chose all newspaper issues from March, June, August and November of each year to represent seasonal variation and to avoid special periods (e.g., summer or December holidays) in advertisement or newspaper stories as suggested by a previous review [21]. After accounting for all issues in a month, the final sample of newspaper issues was 4828.

Coding instruments

We developed three coding instruments to analyze advertisement images, non-advertisement images and articles based on reviews of previously used coding instruments [16,18,19,22]. To analyze the articles we adapted the American Stop Smoking Intervention Study's (ASSIST) newspaper coding protocol [14–17,23], selecting and adding other variables in order to facilitate comparison with the images. The instrument was then pre-tested and coders were trained on how to use it. For coding purposes, a digital copy of each image and article was made. Inter-coder reliability was determined for all images and articles and a median kappa score of 0.83 (range 0.69–0.88) was obtained [24].

Two domains were examined in each coding instrument. First, the content where different variables were used to analyze the advertisement and non-advertisement and articles. Second, how images and articles were delivered where the same descriptive variables were used in order to compare advertisement, non-advertisement images and articles among them. Content variables for articles included:

1. Article theme: health effects, legislation, advertising, promotions or sponsorship, cigars and economic issues
2. Smoking portrayal: rated on a 7-point scale (from 1 = very negative to 7 = very positive) with positive, neutral or negative in relation to tobacco control objectives.
3. Health consequences: if mentioned or not, and if yes, as positive or negative consequences.
4. Tobacco industry portrayal: positive, negative, neutral or not mentioned.
5. Image or photo: present or not.
6. Opinion slant: positive, neutral or negative to tobacco control objectives.
7. Controversy: present or not.

Content variables for non-advertisement images:

1. Public figures or celebrities: present or not, gender and occupation.
2. Associated event: sports, social, politics, arts or other.
3. Brand: if it was possible to identify any brand in the image or not.

Content variables for advertisement images:

1. Brand.
2. Images: product present or absent; illustration or photograph; if photograph: models, landscape or packs.
3. Associated event: sports, social, political, arts or promotions and contests.
4. Type of tobacco: light or full flavor; cigar or cigarettes.

Descriptive variables related to how the images and articles were delivered:

1. Length: number of pages or space occupied on one page: more than 50%, 25–50% or less than 25%.
2. Placement: page number; day of the week; front page or not and section.

Statistical Analysis

We conducted a preliminary descriptive analysis to examine the distribution of each categorized content (advertisement/non-advertisement images) and extent in articles. We compared the categories by frequency of appearance, length of article or advertisement, placement within the newspaper, images and prominence found in each unit of analysis, using χ^2 as appropriate.

To estimate time trends of each outcome as well as corresponding changes that occurred beginning in 2001, we fitted interrupted time-series models [25] with autocorrelated residuals within the linear repeated measures modeling framework. Each model estimated linear trends separately for the 1995–2000 and 2001–2004 time periods and tested the difference between the pre- and post-restriction trends. We also tested whether the level of each outcome significantly changed between the end of 2000 and the beginning of 2001 given that 2001 was the first full year that the advertising ban was implemented.

Results

We reviewed 4828 newspaper issues and identified and scanned 1800 articles or images (units of analysis). Of these, 1283 or 71.2% (95% confidence intervals (CI) 69.1–73.2%) were classified as non-advertisement images, 157 (8.8%, 95% CI = 7.5–10.1%) as advertisement images, and 360 (20%, 95% CI = 18.2–21.9%) as articles (Table 1). On average, we identified one non-advertisement image per day, one advertisement every 7 days and one article every 4 days.

Non-advertisement images

Non-advertisement images were found more frequently in *La Nación* ($N = 486$, 38%) followed by *Clarín* ($N = 332$, 26%),

Table 1 Tobacco advertising and press coverage of smoking and health in Four Argentinean Newspapers, 1995–2004.

| Newspaper | Non-ad images (%) | Ad images (%) | Articles (%) | Total (%) |
|-----------|-------------------|---------------|--------------|------------|
| Clarín | 332 (26) | 99 (63) | 121 (33.6) | 552 (30.6) |
| La Nación | 486 (38) | 58 (37) | 137 (38.1) | 681 (37.8) |
| Página 12 | 310 (24.2) | None | 60 (16.7) | 370 (20.5) |
| Crónica | 155 (12.1) | None | 42 (11.7) | 197 (10.9) |
| Total | 1283 (71.2) | 157 (8.8) | 360 (20) | 1800 (100) |

Página 12 ($N = 310$, 24.2%) and *Crónica* ($N = 155$, 12.1%). Images showed a public figure or celebrity in 87.8%, 83% were men, 37.8% were sports personalities, 37.1% were politicians or businessmen and 22.7% were actors or musicians. The image referred to an event in 55.2%, and most were sports events (82%). The sports section of the newspapers contained 37.6% ($N = 483$) of the non-advertisement images. We identified a cigarette brand in 38.6% ($N = 495$) of the total of non-advertisement images (Table 2). Most of these were placed in the sport sections, where 88.2% (429) showed a brand. *Marlboro* was the most frequent brand seen in 83.7% (354). On average we identified this brand every three days in a given newspaper. Newspaper coverage of these images was limited to less than a quarter of a page in 55.4%. Images were most likely to appear on Sunday (27.6%) and Monday (21.3%), days with the largest circulation rates (Monday editions report on the results of soccer matches on Sunday). Only 7.4% appeared on the front page and 18.3% appeared in the first four pages (Table 4).

Advertisement images

Advertisement images were published exclusively in the two newspapers with the largest circulation: *Clarín*, 63% ($N = 99$) and *La Nación* 37% ($N = 58$). The ads showed landscapes as the most common image (85%) and a cigarette pack was present in 69% of the advertisements. Only 36% portrayed a human being. Of these, 30% were men, 2% women and 4% included both genders. Half of the advertisement images were related to a specific event and 63% of these were promotions or contests and 29% were sporting events. The most frequently advertised brand was *Marlboro* (61 advertisements, 38.6%) that frequently used promotions and sports

events in 41 (26%) of their ads (Table 3). The Sunday magazine was the section with the most advertisement images with 57% followed by the sports section at 21%. In 63% advertisements usually covered an entire page or more and 20% occupied more than a half page. The Sunday edition had the highest proportion of advertisement images (70%).

Tobacco-focused articles

All newspapers published articles with a tobacco focus including those on health (36.9%) and legislation (36.1%). (Table 4) Health topics included: secondhand smoke and general health effects. Legislation topics included smoking bans and product regulation. A negative representation of smoking was found in 75.3% of articles (Table 4). Only 55.3% of the articles mentioned the negative effects of smoking. The tobacco industry was not mentioned or was mentioned indifferently in 66.4% of the articles. Only in one-quarter of articles the industry was referred to in negative terms. Articles also presented tobacco issues as controversial in 27.4% (Table 4). Less than half of the articles (45.7%) covered less than a quarter of one page and 24% occupied between a quarter and half a page. Only 12% of articles extended to a full page and these were found mainly in the general information section (58.3%) and in the health and science section (21.4%). Only 21% were published on Sunday and 21.7% appeared on the front page. An image or photo was present in 52.4% (Table 4).

Interrupted time-series analyses

Prior to 2001, the number of advertisement images significantly decreased across time ($B = -3.4$ images per annual

Table 2 Non-advertisement images of smoking in four Argentinean Newspapers, 1995–2004.

| Variables | | Newspaper | | | | |
|---------------|-------------------------------|-------------------------|----------------------------|----------------------------|--------------------------|-------------------------|
| | | Clarín (%) $N = 332$ | La Nación (%) $N = 486$ | Página 12 (%) $N = 310$ | Crónica (%) $N = 155$ | Total (%) $N = 1283$ |
| Public figure | | 289 (22.5) | 428 (33.4) | 271 (21.1) | 139 (10.8) | 1127 (87.8) |
| Men | Male | 275 (21.4) | 406 (31.6) | 260 (20.3) | 124 (9.7) | 1065 (83) |
| Occupation | Athletes | 71 (5.5) | 266 (20.7) | 76 (5.9) | 73 (5.7) | 486 (37.9) |
| | Politicians or Businessmen | 135 (10.5) | 134 (10.4) | 167 (13) | 40 (3.1) | 476 (37.1) |
| | Journalists and others | 17 (1.3) | 9 (0.7) | 3 (0.2) | 1 (0.1) | 30 (2.3) |
| | Actors/ musicians | 109 (8.5) | 77 (6) | 64 (5) | 41 (3.2) | 291 (22.7) |
| Brand shown | Yes | 72 (5.6) | 293 (22.8) | 48 (3.7) | 82 (3.2) | 495 (38.6) |
| Event | Yes | 271 (21.1) | 187 (14.6) | 181 (14.1) | 69 (5.4) | 708 (55.2) |

Table 3 Advertisement images of smoking in two Argentinian Newspapers, 1995–2004.

| | Clarín N = 99 (63%) | La Nación N = 58 (37%) |
|-------------------------|------------------------|---------------------------|
| <i>Brand</i> | | |
| Marlboro | 35 (22.2) | 26 (16.5) |
| Phillip Morris | 14 (8.9) | 6 (3.8) |
| Viceroy | 13 (8.2) | 1 (0.6) |
| L&M | 4 (2.5) | 8 (5.1) |
| Le Mans | 9 (5.7) | 1 (0.6) |
| JClub | 7 (4.4) | 0 (0) |
| Pall Mall | 3 (1.9) | 2 (1.3) |
| Camel | 3 (1.9) | 2 (1.3) |
| Parliament | 0 (0) | 5 (3.2) |
| Chesterfield | 2 (1.3) | 1 (0.6) |
| Derby | 3 (1.9) | 0 (0) |
| Sidney | 3 (1.9) | 0 (0) |
| Gitanes | 1 (0.6) | 2 (1.3) |
| Pariesene | 1 (0.6) | 1 (0.6) |
| V Slims | 0 (0) | 1 (0.6) |
| Davidoff | 0 (0) | 1 (0.6) |
| Lucky Strike | 0 (0) | 1 (0.6) |
| La Misión | 1 (0.6) | 0 (0) |
| <i>Human Figure</i> | | |
| Male | 30 (19) | 17 (10.8) |
| Female | 2 (1.3) | 1 (0.6) |
| Both | 3 (1.9) | 3 (1.9) |
| <i>Landscape</i> | | |
| Yes | 9 (5.7) | 15 (9.5) |
| <i>Pack</i> | | |
| Yes | 65 (41.1) | 43 (27.2) |
| <i>Event</i> | | |
| Yes | 53 (33.5) | 26 (16.5) |
| <i>Kind of Event</i> | | |
| Sports | 15 (9.5) | 8 (4.5) |
| Artistic | 3 (2) | 3 (2) |
| Promotions and contests | 35 (22) | 15 (10) |

4-month observation period, $p < .02$; Fig. 1). In contrast, beginning in 2001 the number of advertising images significantly increased across time ($B = 11.2$ images per annual 4-month observation period, $p < .01$). The pre- and post-restriction slopes significantly differed from one another ($p < .001$). The model-predicted 'instantaneous' increase in the number of advertisement images in 2001 was non-significant ($B = 1.6$, $p = .79$).

Prior to the voluntary restriction, the number of non-advertisement images significantly increased across time ($B = 9.6$ images per annual 4-month observation period, $p < .01$; Fig. 2). In 2001, there was a significant drop in the number of non-advertisement images ($B = -75.0$ images per 4 months, $p < .001$), but thereafter the trend was essentially flat ($B = -1.2$ images per 4 months, $p = .77$). The pre- and post-restriction slopes differed significantly from one another ($p < .05$).

The number of tobacco focused articles declined significantly during the years prior to 2001 ($B = -3.1$ articles per

4 months, $p < .05$; Fig. 3). Afterward, the number of articles increased non-significantly ($B = 2.5$ articles per 4 months, $p = .35$). The pre- and post-restriction slopes were marginally different ($p = .07$). The model-predicted value of the change in the number of articles between the end of 2000 and the beginning of 2001 was non-significant ($B = -0.6$, $p = .93$).

Presentation of tobacco images and articles

We compared images and article size, day of publication, front or first four pages and sections (e.g. sports section) of the newspaper. Most (98%, 62%) of advertisement images were printed on one or more pages. However, most non-advertisement images (721%, 56.2%) and articles (167%, 46.4%) were printed on less than a quarter of a page ($\chi^2 = 380.97$, $p = 0, 001$). Regarding day of the week, most advertisements (66.9%) appeared on Sunday compared to 27.6% of the non-advertisement images and 21.1% of articles ($p = 0, 001$). Twenty-two percent (78) of all articles published on the front page of the four newspapers over the 10 years had the title of one tobacco-focused article and 7.4% (95) of all non-advertisement images related to tobacco. Placement on the first four pages was not significantly different for advertisements (22%, 13.9%), non-advertisements (235%, 18.3%), and articles (49%, 13.6%) ($\chi^2 = 5568$, $p = 0.062$).

The section in which images or articles were published reflects the marketing research finding that the most frequently read sections in Argentina are the Sunday magazine and the sports sections of all newspapers [26]. So it is not surprising that the Sunday magazine was the section with the most ads (56.3%), while only 8.9% of the tobacco-focused articles appeared here. The sports section was the section where we found the highest proportion of non-advertisement images (37.4%), while 58.3% of the articles were published in the general information section (Table 5).

Discussion

This study was designed to evaluate and compare the placement and content of tobacco images and tobacco-focused articles published in four national newspapers of Argentina. Our main finding showed that, in general, positives images of tobacco exceeded information favoring tobacco control. These analyses showed that the imposition of the advertising restriction was associated with a change in trends for the three defined outcomes of advertisement images, non-advertisement images and tobacco-focused articles. This change was significant for the two outcomes related to images and marginally significant for the articles despite the relatively small number of observations.

We found that the most frequent items identified were the non-advertisement images, mostly reported on sports events. Almost 40% of them showed a *Marlboro* logo and appeared on average every three days in one newspaper and thus exceeded the frequency of the advertisements. Advertisements were published only in the two best selling newspapers, especially in the Sunday magazine and half of these were associated with a promotion or a contest. Seventy-five percent of tobacco-related articles reported on addiction,

Table 4 Tobacco-focused articles in four Argentinean Newspapers, 1995–2004.

| | Newspaper | | | | Total (%) N = 360 |
|-----------------------------------|--------------------|-----------------------|----------------------|--------------------|-------------------|
| | Clarín (%) N = 121 | La Nación (%) N = 137 | Página 12 (%) N = 60 | Crónica (%) N = 42 | |
| <i>Theme</i> | | | | | |
| Health | 44 (12.2) | 50 (13.9) | 21 (5.8) | 18 (5) | 133 (36.9) |
| Legislation | 51 (14.2) | 43 (11.9) | 22 (6.1) | 14 (3.9) | 130 (36.1) |
| Advertising or promotions | 5 (1.4) | 8 (2.2) | 3 (0.8) | 1 (0.3) | 17 (4.7) |
| Economic issues | 17 (4.7) | 17 (4.7) | 14 (39) | 9 (2.5) | 57 (15.8) |
| Cigars | 4 (1.1) | 19 (5.3) | 0 (0) | 0 (0) | 23 (6.4) |
| <i>Smoking portrayal</i> | | | | | |
| Very negative | 47 (13.1) | 45 (1.5) | 32 (8.9) | 18 (5) | 142 (39.4) |
| Negative | 38 (10.6) | 41 (11.4) | 13 (3.6) | 8 (2.2) | 100 (27.9) |
| Somewhat negative | 8 (2.2) | 11 (3.1) | 4 (1.1) | 6 (1.7) | 29 (8.1) |
| Indifferent | 19 (5.3) | 16 (4.4) | 9 (2.5) | 9 (2.5) | 53 (14.7) |
| Somewhat positive | 0 (0) | 1 (0.3) | 1 (0.3) | 0 (0) | 2 (0.6) |
| Positive | 6 (1.7) | 22 (6.1) | 0 (0) | 1 (0.3) | 29 (8.1) |
| Very positive | 3 (0.8) | 1 (0.3) | 1 (0.3) | 0 (0) | 5 (1.4) |
| <i>Health consequences</i> | | | | | |
| Not mentioned | 45 (12.5) | 70 (19.4) | 21 (5.8) | 16 (4.4) | 152 (42.2) |
| Negative | 70 (19.4) | 65 (18.1) | 38 (10.6) | 26 (7.2) | 199 (55.3) |
| Positive | 6 (1.7) | 2 (0.6) | 1 (0.3) | 0 (0) | 9 (2.5) |
| <i>Tobacco industry portrayal</i> | | | | | |
| Positive | 12 (3.3) | 14 (3.9) | 1 (0.3) | 4 (1.1) | 31 (8.6) |
| Negative | 29 (8.1) | 24 (6.7) | 33 (16.7) | 4 (1.1) | 90 (25) |
| Indifferent | 10 (2.8) | 10 (2.8) | 5 (0.3) | 8 (2.2) | 33 (9.2) |
| Not mentioned | 70 (19.4) | 89 (24.7) | 21 (5.8) | 26 (7.2) | 206 (57.2) |
| <i>Image or photo</i> | | | | | |
| Yes | 59 (16.3) | 75 (20.8) | 51 (14.1) | 5 (1.5) | 190 (52.7) |
| No | 62 (17.2) | 62 (17.3) | 9 (2.6) | 37 (10.4) | 170 (47.3) |
| <i>Opinion slant</i> | | | | | |
| Positive fortobacco control | 45 (12.5) | 56 (15.5) | 60 (16.7) | 38 (10.6) | 199 (55.2) |
| Negative for tobacco control | 5 (1.5) | 10 (2.7) | 0 (0) | 0 (0) | 15 (4.1) |
| Neutral | 71 (19.7) | 71 (19.7) | 0 (0) | 4 (1.1) | 146 (40.5) |
| <i>Controversy</i> | | | | | |
| Yes | 41 (11.4) | 33 (9.2) | 19 (5.3) | 3 (0.8) | 97 (27) |
| No | 80 (22.2) | 104 (28.9) | 41 (11.3) | 39 (10.8) | 263 (73) |

but only 55% reported about the health risks of either active or second hand smoking. To our knowledge there has been no previous work comparing tobacco images with articles in newspapers, even though similar studies from Australia and the US have examined the frequency of tobacco-related articles. In Australia, three articles per day were identified in 2001 compared to only one every four days in the US from 2001 to 2003 [14,15], but neither study examined the frequency of tobacco-related images in the print media.

The time-trend analyses provided some empirical evidence that the tobacco industry's "voluntary" advertisement restriction was compensated by a strategy to increase their presence in the print media. Our analyses showed that the prevalence of ad images and articles decreased across the pre-restriction period but the trends changed direction beginning in 2001. The mixture of articles with positive, neu-

tral and negative messages confounded the same trend observed for tobacco-focused articles. However, given the interrupted time-series design and the very clear pre-2001/post-2001 differences in outcome trends and levels, the evidence provides a very strong basis for making a *causal* inference that the initiation of the voluntary ban or, underlying processes that were coordinated in time with it, was causally related to the observed changes in outcomes. The increased prevalence of non-ad images during the 1995–2000 period and the large drop between 2000 and 2001 are unexplained. One possibility is that this reflected heavy tobacco endorsement of international car racing sporting events that were coincidentally banned in 2000. A clear explanation for all the changes around 2001 is not evident.

Our study results are subject to several limitations. First, the estimated drop in the number of non-ad images that

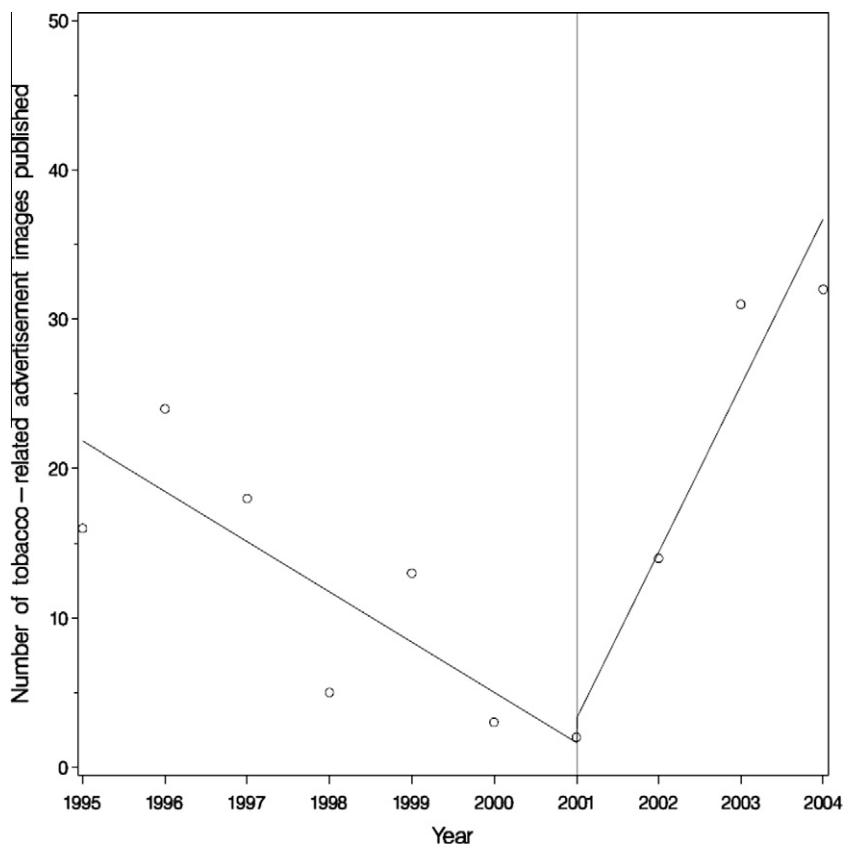


Figure 1 Time trend of the advertisement images published from 1995 to 2004.

occurred between the end of 2000 and the beginning of 2001 may partially reflect sampling design given that we only sampled newspaper issues from 4 months out of the year. Those 4 months were selected to represent different seasons and if we assumed these were representative of the remaining 8 months within each calendar year, one would project that the 'instantaneous' drop in the number of non-ad images between the end of 2000 and the beginning of 2001 to equal 225 non-ad images. A second limitation is whether we can generalize our findings to all Argentinean print media because we focused on national newspapers only. Nevertheless, national newspapers are the most widely read print media in the country and probably influence the format and content of regional media. Also, it is important to take into account that during the 10 years there was a significant change in the way these newspapers were read, because of the increase in their availability on the web. In 1999, 30% of the population between 14 and 65 years of age had read one of these newspapers in the previous seven days. By 2004 less than 22% had read the printed version. In the same period, readership on the web increased from 3.48% to 10.38% [27].

Another limitation may be the search process for images as this had to be done manually and thus may have led to under-detection due to human error. We also took a very broad definition of non-advertisement images and included any images related to tobacco even without the presence of a commercial product. However, two independent reviewers coded each newspaper image and thus we feel that the classification of images portraying a positive image

about tobacco is valid. We have no evidence that these images were placed in the newspapers by the tobacco industry's efforts as was demonstrated in another study [28]. However, this broad definition allows us to confirm how frequent these images are, reflecting the social acceptance of smoking in Argentina.

A major strength of our study was to analyze articles and images and compare them in a large sample of the four unique national newspapers of Argentina over a 10-year period. Furthermore, we used an interrupted time-series design which showed changes in three outcomes that clearly corresponded to the initiation of the voluntary restriction in 2001. The development of two different coding instruments to analyze images and the adaptation of the ASSIST model to analyze articles gave us a framework in which excellent inter-coder agreement was reached. In order to minimize human error in the search for tobacco-focused articles, we searched the web page of each newspaper using "tobacco", "cigarettes" and "smoking" as key words as previously reported in other studies [14–17].

The results reported here have important implications for Argentinean public health policy makers. As of February 2010 Argentina has a partial tobacco-advertising ban that does not include the print media and thus there is no evidence that the trends observed for the 1995–2004 decade have changed. We provide locally relevant evidence describing an upward trend in tobacco newspaper advertising after the voluntary exclusion of radio and television advertisements in 2001 that is likely to be still valid today. These data should prove useful support for a comprehensive

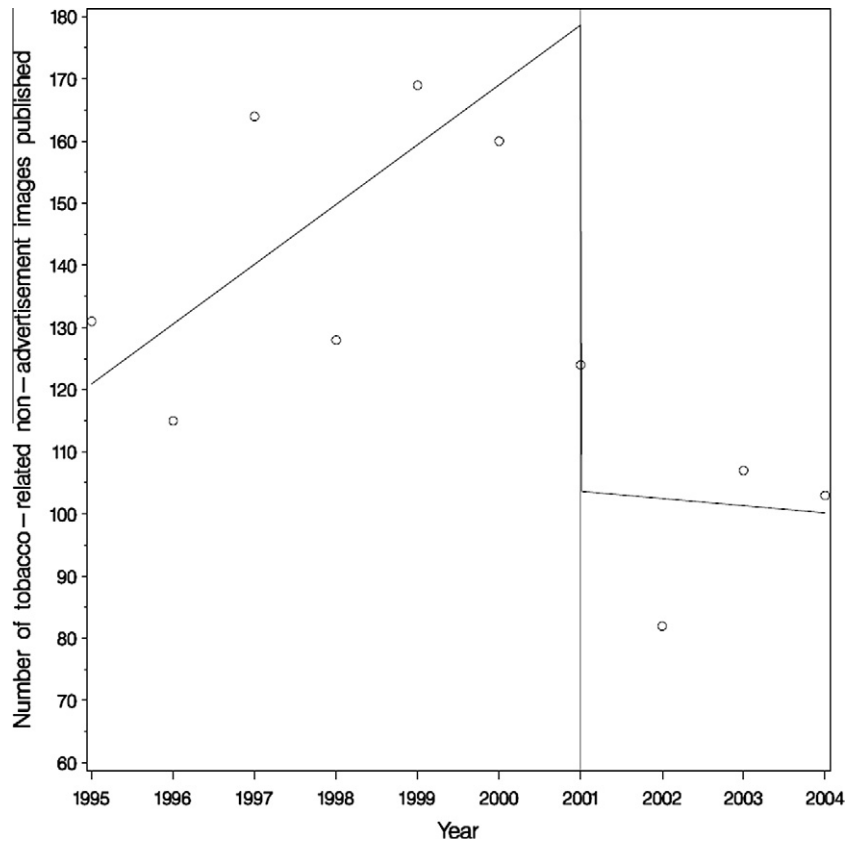


Figure 2 Time trend of the non-advertisement images.

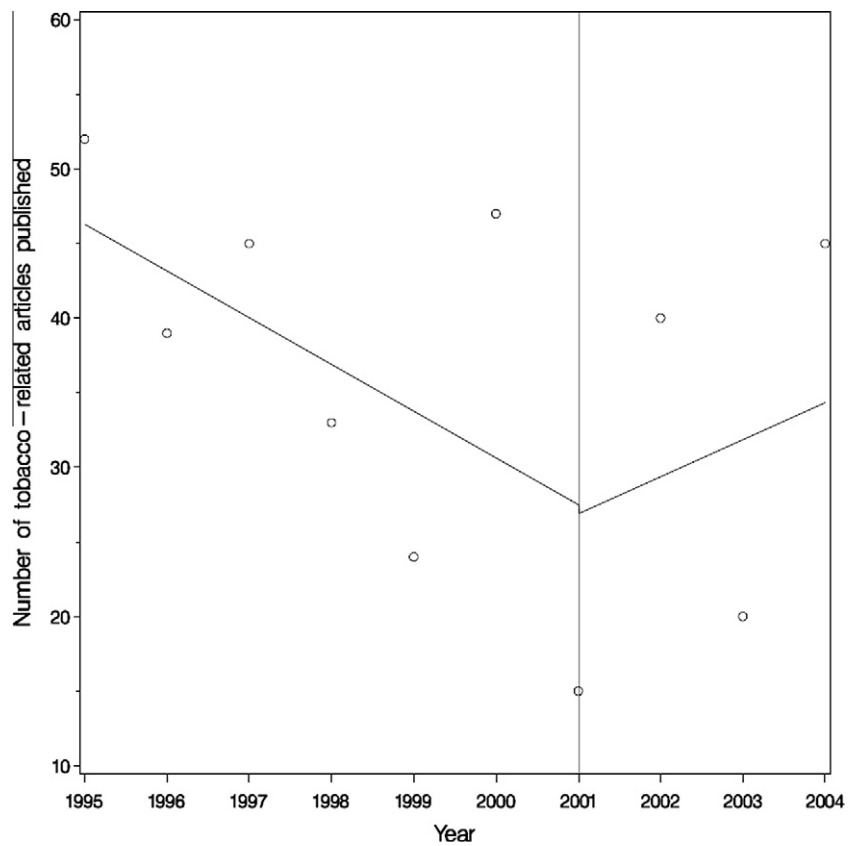


Figure 3 Time trends of the articles published from 1995 to 2004.

Table 5 Comparison of newspaper coverage, location, and day of the week for tobacco-related advertisement images, non-advertisement images and articles in four Argentinean newspapers, 1995–2004.

| Variables | Advertisements N = 158 (%) | Non-ad images N = 158 (%) | Tobacco-focused articles N = 360 (%) | χ^2 | p |
|----------------------------|-------------------------------|------------------------------|---|----------|--------|
| Size: One page or more | 98 (62) | 122 (9.5) | 44 (12.2) | 380.97 | <0.001 |
| >50% | 32 (20.2) | 115 (9) | 67 (18.6) | | |
| 25–50% | 17 (10.8) | 325 (25.3) | 82 (22.8) | | |
| <25% | 11 (7) | 721 (56.2) | 167 (46.4) | | |
| Day of publication: Monday | 24 (15.2) | 275 (21.4) | 34 (9.4) | 189.597 | <0.001 |
| Tuesday | 2 (1.2) | 100 (7.8) | 48 (13.3) | | |
| Wednesday | 1 (0.6) | 114 (8.9) | 46 (12.8) | | |
| Thursday | 20 (12) | 162 (12.6) | 42 (11.7) | | |
| Friday | 4 (2.5) | 137 (10.7) | 46 (12.8) | | |
| Saturday | 1 (0.6) | 142 (11) | 68 (18.9) | | |
| Sunday | 106 (67) | 353 (27.6) | 76 (21.1) | | |
| Front page: Yes | 0 (0) | 95(7,4) | 78 (21.7) | | |
| Four first pages: Yes | 22 (13.9) | 235 (18.3) | 49 (13.6) | 5.568 | 0.062 |
| No | 136 (86.1) | 1048 (41.7) | 311 (86.4) | | |
| Section: Sports | 35 (22.2) | 483 (37.6) | 8 (2.2) | | |
| Cultural | 0 (0) | 112 (8.7) | 1 (0.3) | | |
| Show business | 10 (6.3) | 272 (21.2) | 0 (0) | | |
| General information | 3 (1.9) | 137 (10.7) | 210 (58.3) | | |
| Business | 2 (1.3) | 22 (1.7) | 25 (6.9) | | |
| Sunday magazine | 89 (56.3) | 106 (8.3) | 32 (8.9) | | |
| Health and Science | 17 (10.8) | 129 (10.1) | 77 (21.4) | | |
| Others | 2 (1.3) | 22 (1.7) | 7 (2) | | |

advertising ban. Furthermore, in Argentina data on the advertising budget of the tobacco industry are not available to the public. As has been described in other parts of the world, when a partial ban is applied, cigarette manufacturers simply shift advertising expenditures to the print media [29]. Studies from 102 countries have shown that only a complete ban can help significantly reduce tobacco consumption [30]. A complete ban would not only affect traditional direct advertising, but as presented here, would encompass tobacco images classified as non-advertisements in the sports sections of newspapers. A total ban on indirect advertising or brand stretching would include sponsorship and product placement. Non-advertisement images can be a very effective form of tobacco advertising as part of an intentional industry strategy to circumvent a partial ban. This approach may also have implications for tobacco industry indirect advertising on the World Wide Web and through social network sites.

Finally, our research showed that the Argentinean national press published articles with more pro tobacco consumption influences than information about tobacco health risks over the 10 years of our study. Furthermore, it is important to emphasize that we could not find any counter tobacco campaign in the media during this period. Although the efficacy of media campaigns has been established, this kind of intervention is expensive and short [15]. Therefore, it may be necessary to plan a change in the way that Argentinean press covers tobacco issues and to initiate a media advocacy process. Media advocacy efforts consist of stakeholders working both to shape and create news in order to publicize study findings, as well as

organizing and commenting on potentially newsworthy events [16]. This type of intervention can increase news coverage of tobacco issues and reduce cigarettes sales as well as increase smoking cessation rates [10,15].

In conclusion, our study confirms that tobacco advertising images and articles are common in Argentina's four main national newspapers. There was a consistent trend to intensify advertisement images when electronic advertisements were restricted. This initial study can serve as a starting point for future comparisons within Argentina and in other Latin American countries. Furthermore, this study adds empirical evidence from a middle-income country that partial restrictions are ineffective and only a complete advertising ban will help decrease the tobacco epidemic.

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