

International Reach of Tobacco Marketing Among Young Children

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KEY WORDS

advertising, smoking, media, cigarettes, tobacco, preschoolers, Marlboro, China, Russia, India, Pakistan, Nigeria, Brazil

ABBREVIATIONS

FCTC—Framework Convention on Tobacco Control

LMIC—low- and middle-income country

OR—odds ratio

Dr Borzekowski originated the idea for this research study, developed the research protocol and instruments, obtained overall and local institutional review board clearance for this work, subcontracted and trained researchers in the 6 countries to conduct data collection and data entry, and analyzed the data and prepared the manuscript; and Dr Cohen helped secure funding for this work and assisted with protocol and instrument development, data analysis, and write-up of the findings.

www.pediatrics.org/cgi/doi/10.1542/peds.2013-1150

doi:10.1542/peds.2013-1150

Accepted for publication Jul 25, 2013

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PEDIATRICS (ISSN Numbers: Print, 0031-4005; Online, 1098-4275).

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FINANCIAL DISCLOSURE: The authors have indicated they have no financial relationships relevant to the article to disclose.

FUNDING: Supported by a grant from the Institute for Global Tobacco Control with funding from the Bloomberg Initiative to Reduce Tobacco Use.

POTENTIAL CONFLICT OF INTEREST: The authors have indicated they have no potential conflicts of interest to disclose.



WHAT'S KNOWN ON THIS SUBJECT: Prosmoking messages, delivered through marketing and the media, can reach very young children and influence attitudes and behaviors around smoking.



WHAT THIS STUDY ADDS: Marketing of tobacco and cigarette brands has successfully reached young children in low- and middle-income countries. More effective measures are needed to restrict the reach of tobacco marketing.

abstract

FREE

BACKGROUND: Prosmoking messages, delivered through marketing and the media, can reach very young children and influence attitudes and behaviors around smoking. This study examined the reach of tobacco marketing to 5 and 6 year olds in 6 low- and middle-income countries.

METHODS: Researchers worked one-on-one with 5 and 6 year olds in Brazil, China, India, Nigeria, Pakistan, and Russia ($N = 2423$). The children were asked to match logos with pictures of products, including 8 logos for cigarette brands. Analyses examined, overall and by country, whether gender, age, location, household use of tobacco, and knowledge of media characters were associated with awareness of cigarette brand logos. Additional analyses considered the relationship between cigarette brand logo awareness and intentions to smoke.

RESULTS: Overall, 68% of 5 and 6 year olds could identify at least 1 cigarette brand logo, ranging from 50% in Russia to 86% in China. Across countries, being slightly older and having someone in the household who used tobacco, were significantly associated with greater odds of being able to identify at least 1 cigarette brand logo.

CONCLUSIONS: The majority of young children from low- and middle-income countries are familiar with cigarette brands. This study's findings suggest that more effective measures are needed to restrict the reach of tobacco marketing. *Pediatrics* 2013;132:e825–e831

Twenty-two years ago, a small study made a huge impact on the way tobacco is marketed in the United States. Fischer et al¹ found that 6-year-old boys and girls recognized with similarly high rates logos of the Disney Channel's Mickey Mouse and Camel cigarettes' Old Joe Camel. This and similar studies revealed sophisticated and effective marketing practices that were clearly reaching young children.²⁻⁴ The upshot of these studies and the publicity they garnered was stricter regulations around tobacco advertising in the United States.^{5,6}

Although many factors are associated with tobacco use, research shows that exposure to, interest in, and positive attitudes about protobacco marketing and media messages are associated with increased odds of youth liking smoking, early initiation, and increased use.^{7,8} This phenomenon seems to be global. Studies conducted around the world have found that youth with high exposure and awareness levels to protobacco messaging, whether through advertising, point-of-sale displays, depictions in movies, or promotional materials, are more likely to smoke.⁸⁻¹¹

In 2003, the World Health Assembly responded to the global tobacco epidemic by adopting the Framework Convention on Tobacco Control (FCTC). Article 13 of the FCTC addresses tobacco advertising, promotion, and sponsorship, whereas Article 11 focuses on tobacco packaging and labeling; however, there is evidence and concern that there is still a long way to go to achieve full implementation of the recommended provisions.¹² Tobacco use trends suggest that multinational tobacco companies have moved their promotional efforts from high-income, industrialized countries to low- and middle-income countries (LMICs).¹³ In many LMICs, weak tobacco control policies and/or poor enforcement of these policies, coupled with the strong

presence of the tobacco industry, can contribute to an overall high level of protobacco influences.^{14,15}

If children living in LMICs have a high awareness of tobacco brands, positive attitudes, and intentions to smoke, then stronger efforts need to be implemented to protect this vulnerable population. This 6-country study investigated young children's recognition of tobacco brands and is the first attempt to our knowledge to gather data on the reach of tobacco marketing among preschool-aged children in LMICs.

METHODS

Sample

The World Health Organization divides the world's countries into 6 regions: Americas, Western Pacific, South-East Asia, Africa, the Eastern Mediterranean, and Europe. This study was conducted in the LMICs (based on the World Bank classifications) with the highest number of adult smokers.^{14,16} Information on number of smokers was obtained through the World Health Organization's Global Tobacco Control Report.¹⁴ For this work, data collection occurred in Brazil, China, India, Nigeria, Pakistan, and the Russian Federation (hereafter referred to as Russia).

Working with in-country public health professionals, an area in each country was selected that would clearly represent an urban and a rural population. Table 1 lists by country the geographic areas from where the samples were drawn. Next, a cluster sample strategy was performed in which low- and middle-income regions were first identified and then neighborhoods for recruitment were randomly selected. In India, Nigeria, Pakistan, and Russia, researchers went on a specified path through selected neighborhoods and found households in which a 5- or 6-year-old child lived and there was an

available parent or guardian to give consent. In Brazil and China, all schools with students in our specified age range from the selected low- and middle-income neighborhoods were identified. Schools from this list were randomly selected, and then recruitment occurred by asking all parents if they and their children would be willing to participate in a health survey. From among those willing to participate, researchers randomly selected subjects and came to the schools on consecutive mornings and afternoons to interview children and their parents/guardians. Data on eligible participants and refusals by country are available upon request.

In each country, the study design and protocols were approved by official in-country review boards. Additionally, an overall review and approval were obtained through the Johns Hopkins Institutional Review Board. Active parental and participant consent was obtained.

Procedures

In person, one of the authors trained local researchers, ensuring standardization but allowing for necessary variations across countries. Additionally, pilot testing occurred in each country to test the feasibility and cultural appropriateness of the protocols and the instruments. In China, India, Nigeria, Pakistan, and Russia, data were collected in the spring of 2012; Brazil's data collection was delayed until late fall of 2012 because of nationwide strikes stalling institutional review board review. Data collection lasted, on average, 30 minutes with the child and 8 minutes with the parent/guardian.

For both the child and parent/guardian participants, researchers went through the survey instruments, interviewing subjects one on one. Data collection was performed in the local language and dialect of the participants. In addition to

TABLE 1 Locations Where Data Collection Occurred

	Brazil	China	India	Nigeria	Pakistan	Russia
Urban	Rio de Janeiro locations (North, South, and West districts)	Center of Qi County	New Delhi locations (Rohini Sec-1, Mangolpuri, Ranjeet Nagar, Baljeet Nagar, Paschim vihar, Multan Nagar, Mayur vihar-3, DDA Flat Mayur vihar, Mandawali, Vashist Park, Sagarpur, and Nehru Nagar)	Osun State locations (Aubiaro and Dada Estate)	Islamabad locations including Dhoke Ratta, Khayaban-e-sirsyed, Gujjar Khane, Taxila Sarai Kala, Taxila Mahra Shah, Afandi Colony, Millat Colony, and Dhoke Munshi Khan	Moscow locations (Central, East, North, Northeast, Northwest, South, Southeast, Southwest, West, Zelenograd) Nizhniy Novgorod locations (Autozavodskiy, Kanavino, Leninskiy, Moscovskiy, Nizhegorodskiy, Priokskiy, Sormovo, and Sovetskiy)
Rural	Seropedica County	Jialing town of Qi County	Rawalpindi locations (Hastsal, Bindapur, Kutubgarh, Rani Khera, Kanjhawla, Ghitonini, Aya Nagar, Chattarpur, Dullupura, Samaspur, and Karawal Nagar)	Osun State locations (Iloko Ijesa and Ijebu Ijesa)	Rawalpindi District locations (Usman Khattar, Gujjar Khan Noorwasla, Kotali Sattian Karore, Muree Numbal, Katali Santh Saroola, Potha Sharif, Chak Beli Khan, and Thatha Khalil)	Moscow locations (Balashikha, Vidnoye, Pavlov Posad, Podolsk, Jeleznodorozniy, Dzerjinskiy, Orekhovo Zuevo, Mytishy, Reutov, Bolshiye Dvory) Nizhniy Novgorod locations (Balakhna, Kstovo, Dzerjinsk, Gorbatovka, Lyskovo, Dalnee Konstantinovo, Zhdanovskiy, and Semenov)

demographic information and ownership of household items, parents/guardians provided information on household members and their use of tobacco products. For the children, the instruments were developmentally appropriate; most questions involved showing pictures, and children's answers could be offered through verbalizing a single word, manipulating cards, or pointing to a response. After several warm-up questions, researchers posed questions to assess the child's media exposure, familiarity with cigarette brand logos, and intentions to use tobacco.

Measures

Familiarity With Tobacco Logos

Children played a matching game to show familiarity with logos with their respective objects. In this game (of which there were 24 different brand logos), there were 8 tobacco brands, 4 domestic and 4 international brands (except for Nigeria where we were unable to offer domestic brands). The logos were the most common ones, reflecting those a child would come

across in his or her country. Several logos involved English letters and words, even though other languages and characters were used in these countries. The researcher laid out picture cards of 12 different objects, including items not represented by any brand logos. Children performed the physical manipulation of matching the cards. A 13th picture card of a question mark was available; this symbol was explained so that all participants understood that they should use this card when they did not know the brand logo (guessing was discouraged). Children received scores for their specific knowledge and overall familiarity with tobacco logos. We observed the overall Cronbach's α for the 8 cigarette brand items to be 0.77 (ranging from 0.45 in India to 0.89 in China).

Intentions to Smoke Cigarettes

Researchers handed the children a Yes/No card and presented a series of 9 questions about who they might be and what they might do when they grew up and were "big people." To indicate their answers, children could point to "yes"

or "no." Along with the questions "Do you think you will drive a car?" and "Do you think you will be in trouble with the police?" was the question "Do you think you will smoke cigarettes?" Children who responded "yes" had a positive score on intentions to smoke cigarettes.

Media Exposure

This study used an innovative approach to assess media exposure. This measure, which has been successfully used with preschool-aged children in other countries,^{17,18} involved children who provided characters' exact names. Researchers presented participants with a picture card featuring 12 current and popular characters (5 domestic, 5 international, and 2 foils). Media exposure scores were based on the number of characters a child could correctly name. In contrast to asking self-report estimates of time spent with media, this measure reflects not only exposure but also receptivity, meaning how well a person may or may not recall media messages. Overall, the Cronbach's α for these 10 items

(removing the foils) was 0.78 (ranging from 0.52 in Brazil to 0.83 in Nigeria).

Statistical Analyses

First we considered the internal consistency of our measures by calculating Cronbach's α scores (as reported in the previous section). Whereas average Cronbach's α scores were acceptable (>0.70), some in-country scores fell below the acceptable range, most likely because of the heterogeneous nature of the tested items.¹⁹ After preliminary exploration of the data, we used bivariate and multivariate analyses to explore factors (gender, age, location, household use of tobacco, and knowledge of media characters) associated with awareness of cigarette brand logos and intentions to smoke. Linear and logistic regression models were created for the overall data set (by using dummy variables for country) and for each individual country. Statistical significance was judged at the $P < .05$ level.

RESULTS

Information about the sample is shown in Table 2. Overall, two-thirds (67.9%) of

the participating children could identify at least 1 cigarette brand logo, ranging from 50.1% in Russia to 85.9% in China (Table 3). More than a quarter (26.3%) could identify 2 to 3 brands, and 18.2% could identify ≥ 4 brands. In Brazil and India (both $P < .001$), on average, children could identify more domestic compared with international cigarette brand logos; in China, children were more aware of international cigarette brands ($P < .001$).

Factors associated with cigarette brand awareness varied by country. A child's gender was significantly associated with identifying at least 1 cigarette brand in just 3 countries: in Brazil and Nigeria, being male was associated with lower odds of identifying at least 1 cigarette brand (Brazil: odds ratio [OR] = 0.5, $P < .01$; Nigeria: OR = 0.6, $P < .05$); in Pakistan, being male was associated with higher odds identifying at least 1 cigarette brand (OR = 2.2, $P < .01$). Also, being 6 instead of 5 years old was related to brand awareness in Brazil (OR = 1.5, $P < .06$), China (OR = 3.2, $P < .001$), Nigeria (OR = 1.5, $P < .05$), and Pakistan (OR = 2.0,

$P < .05$). In both India and Nigeria, children in urban locations were less likely than those from rural locations to be able to identify at least 1 cigarette brand logo (OR = 0.4, $P < .001$, and OR = 0.5, $P < .01$, respectively). In contrast, rural children in Brazil were less likely than urban children to know at least 1 cigarette brand (OR = 0.4, $P < .001$). Having someone in one's household who used tobacco was significantly related to awareness of a cigarette brand in Brazil (OR = 3.6, $P < .001$), Pakistan (OR = 1.8, $P < .05$), and Russia (OR = 1.9, $P < .01$). In China, greater media exposure was significantly associated with the higher likelihood of being able to identify at least 1 cigarette brand (OR = 1.6, $P < .001$), whereas in Nigeria (OR = 0.8, $P < .001$), the reverse was true. There, greater media exposure predicted a lower likelihood of cigarette brand awareness.

The greatest intention to smoke was among the Indian children. Almost a third (30.2%) indicated that they would smoke cigarettes when they were grown; interestingly, there were

TABLE 2 Description of the Sample, Demographics, and Awareness of Cigarette Brands

	Overall (<i>N</i> = 2423)	Brazil (<i>n</i> = 398)	China (<i>n</i> = 396)	India (<i>n</i> = 444)	Nigeria (<i>n</i> = 385)	Pakistan (<i>n</i> = 399)	Russia (<i>n</i> = 401)
Gender, <i>n</i> (%)							
Male	1260 (52.0)	183 (46.0)	204 (51.5)	260 (58.6)	193 (50.1)	219 (54.9)	201 (50.1)
Female	1163 (48.0)	215 (54.0)	192 (48.5)	184 (41.4)	192 (49.9)	180 (45.1)	200 (49.9)
Age, <i>n</i> (%)							
5 years	1119 (46.2)	169 (42.5)	152 (38.4)	224 (50.5)	195 (50.7)	179 (44.9)	200 (49.9)
6 years	1304 (53.8)	229 (57.5)	244 (61.6)	220 (49.5)	190 (49.3)	220 (55.1)	201 (50.1)
Location, <i>n</i> (%)							
Urban	1195 (49.3)	200 (50.3)	198 (50.0)	222 (50.0)	189 (49.1)	186 (46.6)	200 (49.9)
Rural	1228 (50.7)	198 (49.7)	198 (50.0)	222 (50.0)	196 (50.9)	213 (53.4)	201 (50.1)
Someone in the children's household uses tobacco, <i>n</i> (%)	832 (34.5)	73 (18.6)	280 (70.9)	87 (19.7)	9 (2.3)	200 (50.1)	183 (45.6)
Parent uses tobacco, <i>n</i> (%)	723 (30.0)	61 (15.5)	258 (65.3)	54 (12.2)	6 (1.6)	177 (44.4)	167 (41.7)
Knowledge of media characters ^a , mean (SD)	5.9 (2.8)	7.9 (1.3)	7.5 (1.7)	5.8 (1.9)	3.4 (2.9)	3.1 (1.9)	8.0 (1.6)
Intention to smoke, <i>n</i> (%)	327 (13.5)	32 (8.0)	86 (21.7)	134 (30.2)	40 (10.4)	21 (5.3)	14 (3.5)
Identify any cigarette brand, <i>n</i> (%)	1646 (67.9)	236 (59.3)	340 (85.9)	337 (75.9)	197 (51.2)	335 (84.0)	201 (50.1)
Knowledge of cigarette brands ^b , mean (SD)	1.9 (2.1)	1.5 (1.7)	3.8 (3.0)	1.6 (1.4)	1.0 (1.3)	2.2 (1.6)	1.0 (1.4)
Can identify Marlboro, <i>n</i> (%)	525 (21.7)	64 (16.1)	169 (42.7)	68 (15.3)	37 (9.6)	95 (23.9)	92 (22.9)

^a Range: 0–10, number of known characters.

^b Range: 0–8, number of known brands.

TABLE 3 Factors Associated With Children's Ability to Identify at Least One Cigarette Brand ($N = 2423$)

	Overall Adj. Odds Ratio (95% Conf. Int.)
Country	
Brazil	1.00
China	3.1 (2.15, 4.49)
India	2.1 (1.53, 2.89)
Nigeria	0.7 (0.47, 0.97)
Pakistan	2.6 (1.71, 3.88)
Russia	0.6 (0.45, 0.80)
Gender	
Male	1.00
Female	1.1 (0.91, 1.32)
Age	
5 years	1.00
6 years	1.4 (1.16, 1.68)
Location	
Urban	1.00
Rural	1.1 (0.90, 1.31)
Someone in the child's household uses tobacco	1.9 (1.49, 2.37)
Knowledge of media characters	0.9 (0.91, 1.01)

no significant differences between Indian boys and girls. Gender, however, was significantly associated with smoking intentions in China (OR = 1.7, $P < .05$), Nigeria (OR = 2.2, $P < .05$), Pakistan (OR = 5.3, $P < .01$), and Russia (OR = 6.3, $P < .05$), where boys were more likely than girls to say that they would smoke later in life. Being 6 instead of 5 years old was significantly associated with a lower likelihood to report smoking intentions in Brazil (OR = 0.3, $P < .001$), China (OR = 0.6, $P < .05$), Nigeria (OR = 0.4, $P < .01$), and Pakistan (OR = 0.4, $P < .05$). Only in Russia was having someone in the household who used tobacco significantly related to greater intentions to smoke (OR = 4.6, $P < .05$). Higher media exposure was associated with lower smoking intentions in Nigeria (OR = 0.8, $P < .01$) and Russia (OR = 0.8, $P < .01$) but with higher intentions in China (OR = 1.2, $P < .01$).

By exploring multivariate models to predict the ability to name at least 1 cigarette brand logo, we observed in the overall models (as shown in Table 3)

that children in China, India, and Pakistan were more likely to be aware of cigarette brands, compared with the reference of Brazil. Children in Nigeria and Russia were less likely to correctly identify a cigarette brand. Being slightly older, having someone in the household who used tobacco, and having greater media exposure were associated with greater odds of being able to identify at least 1 cigarette brand. Models for each country are presented in Table 4.

Finally, considering the overall model examining intentions to smoke as an adult, we observed that being male and younger are significant predictors. Location (rural versus urban), having someone in the household who smoked, knowledge of media characters, or identification of at least 1 cigarette brand were not significant predictors.

DISCUSSION

We found that among very young children from 6 LMICs, two-thirds can identify at least 1 cigarette brand logo. Whereas restrictions to tobacco marketing in high-income, industrialized countries have shown decreases in logo recognition and has been associated with smoking uptake by youth,²⁰ this study suggests that stronger regulations need to be instituted and better enforced in LMICs, where tobacco companies have made great efforts to encourage uptake of their products.¹³ Of particular concern was the sample from China, where >28% of the population smokes (53% of men, 2% of women) and there is concern over whether there is sufficient adherence to the FCTC articles.^{21,22} In China, 86% of the sampled 5 and 6 year olds could identify at least 1 cigarette brand.

Claims are often made that parents and not governments or corporations should keep children away from harmful products such as tobacco. Interestingly, in 3 of the country samples (Brazil, Pakistan, and Russia), having

someone in the household who smoked was associated with recognizing at least 1 cigarette brand. In contrast, this factor was not significant in China, India, and Nigeria. This finding suggests that, for some children, exposure to cigarettes may occur in the home, and for others, it can be through a variety of settings such as the neighborhood, print and electronic media, as well as other acquaintances. In this study, only in China was greater media exposure associated with higher odds of knowing a cigarette brand. This result suggests that the removal of cigarette commercials is having a positive impact on lessening children's awareness of brands. More work, though should be done to restrict the deliberate use of cigarette brands as props in television shows and movies.²³

Although this study was conducted in several countries, the participants came from a single rural and urban area and may not reflect the national populations in each country. Possibly in other areas one might find different awareness and relationships with smoking intentions. In this study, however, efforts were made to measure "typical" children and not those from more wealthy, cosmopolitan communities (where awareness of tobacco marketing would presumably be higher).

A strength of this study is the mindfulness involved in assessing young children's awareness and intentions. Average reliability statistics were acceptable,¹⁹ confirming that the protocols and instruments used were developmentally and culturally appropriate, and reflected conventional knowledge about cigarettes and media. As expected, we observed variability across the countries. Not only do the selected countries differ in their smoking rates and public policies around tobacco advertising¹⁴ but they also vary tremendously in children's

TABLE 4 Factors Associated With Ability to Identify at Least One Cigarette Brand

	Brazil Adjusted OR (95% CI)	China Adjusted OR (95% CI)	India Adjusted OR (95% CI)	Nigeria Adjusted OR (95% CI)	Pakistan Adjusted OR (95% CI)	Russia Adjusted OR (95% CI)
Gender						
Male	1.00	1.00	1.00	1.00	1.00	1.00
Female	1.55 (1.01, 2.38)	1.25 (0.67, 2.34)	1.21 (0.77, 1.92)	1.45 (0.95, 2.21)	0.46 (0.27, 0.81)	0.73 (0.49, 1.08)
Age						
5 years	1.00	1.00	1.00	1.00	1.00	1.00
6 years	1.37 (0.89, 2.13)	1.89 (1.00, 3.60)	0.75 (0.48, 1.18)	1.72 (1.12, 2.64)	2.01 (1.15, 3.5)	1.06 (0.70, 1.61)
Location						
Urban	1.00	1.00	1.00	1.00	1.00	1.00
Rural	0.42 (0.27, 0.65)	2.39 (1.21, 4.72)	2.36 (1.49, 3.74)	1.36 (0.82, 2.24)	0.69 (0.36, 1.33)	0.76 (0.50, 1.14)
Someone in the children's household uses tobacco	3.47 (1.83, 6.58)	1.63 (0.81, 3.03)	1.25 (0.69, 2.24)	3.26 (0.65, 6.24)	1.79 (1.02, 3.15)	1.8 (1.20, 2.70)
Knowledge of media characters	0.97 (0.83, 1.15)	1.64 (1.38, 1.95)	0.90 (0.79, 1.02)	0.86 (0.78, 0.94)	0.9 (0.76, 1.06)	1.12 (0.98, 1.28)

general access to health care and education.²⁴ In this study, the chosen countries all had high numbers of adult smokers, but future research might want to examine locations with comparable cultural, political, and environmental variables.

Despite relatively comprehensive bans, at least in the countries considered in this study,¹⁵ young children are still exposed to tobacco marketing. Tobacco companies are using creative approaches to attract new smokers and to retain existing smokers. For example, in the United States, a large percentage of advertising dollars now goes toward retailers and wholesalers so that they reduce prices and shift displays and merchandising of particular brands.²⁵ Of particular concern is the expected use of new technology and the Internet to bypass country regulations and reach young people with protobacco content and sales.²⁶

When the majority of 5 and 6 year olds from low- and middle-class populations can recognize domestic and international cigarette brands, not only is it critical to have restrictions and bans in place but there also needs to be strict enforcement of such laws. This study's findings suggest that more rigorous approaches should be used to reduce the reach of tobacco marketing to very young children. For example, removing

logos and using plain packaging could alter perceptions around smoking and lessen attraction of target groups to specific cigarette brand logos.^{27,28} A second way to limit promotion would be to change the quantity, location, and types of tobacco retailers, establishing minimum distances between these points of purchase and places frequented by young children.²⁹ A third way to better restrict exposure to cigarette brands and smoking would be to change how onscreen prosmoking media messages reach youth. Numerous prosmoking messages reach young children through current and classic media and researchers have found a dose-response relationship between such exposure and smoking.⁷ A rating system that alerts parents and guardians to this "mature content" could help reduce youth exposure.³⁰

In addition to public health and policy advocates, this study has implications for pediatric health professionals. First, it is important for practitioners to be aware that young children are aware of cigarette logos and are likely to be susceptible to prosmoking messages. Parents who smoke cigarettes should be regularly advised to avoid using these products around their young children. Pediatric patients should be counseled not to use, or start using, tobacco products. In addition, pediatric health professionals

should become involved in tobacco control efforts in their jurisdictions and beyond, including advocating for stronger tobacco control policies such as comprehensive bans on the advertising and promotion of tobacco products.

To our knowledge, this is the first study to examine cigarette brand awareness among young children from several countries. Whereas there were differences across samples, we consistently found high brand awareness among children aged 5 and 6 years. Given the established link between exposure to tobacco marketing and increased odds of starting to smoke, these findings should be a clarion call to significantly restrict tobacco advertising, promotion, and sponsorship, especially in LMICs, consistent with the requirements and recommendations of the FCTC.

ACKNOWLEDGMENTS

We acknowledge the hard work of our international collaborators, including the teams from Russia (led by Tatiana Voylokova of the Russian Public Opinion Research Center [VCIOM]), China (led by Wu Junqing of Fudan University), India (led by Varun Kumar of Policy Innovations), Nigeria (led by Adesegun Fatusi

of Obafemi Awolowo University), Pakistan (led by Atif Ikram Butt of the Pakistan Center for Communication Programs), and Brazil (led by Rodolfo

C. Ribas of the Federal University of Rio de Janeiro). We also greatly appreciate the assistance of Holly Henry, PhD, Jenny Chan, MSPH, and Jingyan Yang,

MHS, for their work with preparing the instruments, securing institutional review board approval, and managing the data.

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