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Cigarettes point of purchase patterns in 19 low- and middle-income countries: Global Adult Tobacco Survey, 2008–2012

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Abstract

Background—There is little information on cigarette purchasing behavior among smokers globally. Understanding cigarette purchase and point-of-sale patterns can help guide the development and implementation of tobacco control strategies in retail environments.

Objective—The purpose of this study was to identify where adults in 19 countries last purchased cigarettes.

Methods—Data were from 19 low- and middle-income countries that conducted the Global Adult Tobacco Survey (GATS) during 2008–2012. GATS is a nationally representative household survey of adults aged 15 years or older using a standardized protocol to measure tobacco-related behaviors. Data were weighted to yield nationally representative estimates within each country, and summarized by using descriptive statistics.

Results—Overall prevalence of current cigarette smoking ranged from 3.7% in Nigeria to 38.5% in the Russian Federation. Among current cigarette smokers, locations of last purchase were as follows: stores, from 14.6% in Argentina to 98.7% in Bangladesh (median = 66.8%); street vendors, from 0% in Thailand to 35.7% in Vietnam (median = 3.0%); kiosks, from 0.1% in Thailand to 77.3% in Argentina (median = 16.1%); other locations, from 0.3% in China and Egypt to 57.5% in Brazil (median = 2.6%).

Conclusion—Cigarettes are purchased at various retail locations globally. However, stores and kiosks were the main cigarette purchase locations in 18 of the 19 countries assessed. Knowledge

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Conflict of Interest

The authors declare no conflict of interest.

Disclaimer

The findings and conclusions in this report are those of the authors and do not necessarily represent the views of the Centers for Disease Control and Prevention.

Contributors

JK and JH designed the study; LM and SS managed the data; SS and SY analyzed the data. JK, JK, LM, SS, SY, IA, KR and EO interpreted the data, drafted the work, approved the final draft and agree to be accountable for all aspects of the work.

of where cigarette purchases occur could help guide interventions to reduce cigarette accessibility and use.

Keywords

tobacco; smoking; stores; tobacco retail; sources of cigarette purchase; location

INTRODUCTION

Tobacco use is the leading cause of preventable death worldwide[1]. In 2015, smoking was estimated to cause one in ten deaths globally[2]; overall tobacco use accounts for approximately 7 million premature deaths per year, and an additional 890,000 deaths are attributable to secondhand smoke exposure[3, 4]. Approximately 80% of the world's tobacco users reside in low- and middle-income countries (LMICs), and over half of them are projected to die of smoking-related causes if they do not quit[5].

The World Health Organization (WHO) Framework Convention on Tobacco Control (FCTC), which was adopted in 2004, has become one of the most widely embraced treaties in the history of the United Nations, with 181 ratifying members as of July 2017[6, 7]. The treaty obliges parties to abide by the provisions to protect the public's health by adopting numerous evidence-based measures to decrease the use of tobacco. These measures are embodied in the six-component WHO MPOWER package: *Monitor* tobacco use and prevention policies; *Protect* people from tobacco smoke; *Offer* help to quit tobacco use; *Warn* about the dangers of tobacco; *Enforce* bans on tobacco advertising, promotion, and sponsorship; and *Raise* taxes on tobacco[8].

Awareness of global patterns in tobacco use and other tobacco-related behaviors, such as tobacco purchase patterns, could play an important role in guiding efforts to curtail tobacco use and assist countries with development and implementation of point-of-sale policies[9]. For example, high retailer density is associated with higher overall smoking prevalence, and studies show that a reduction in the number of retail tobacco outlets may contribute to reducing smoking prevalence[10–13]. Moreover, a systematic analysis of ex-tobacco retailers in New South Wales, Australia, found that reducing the number of tobacco retailers can decrease access to cigarettes[14]. In many countries, tobacco products can be sold at a variety of point-of-sale locations[15, 16], and evidence from high-income countries has concluded that environmental and policy approaches to tobacco control, including point-of-sale policies, are effective in changing societal norms about tobacco use[10–19]. Evidence show that bans on POS advertising significantly contribute to reduction in smoking [20, 21, 22].

To date, there is little information on cigarette purchase patterns among many low- and middle-income countries. To fill this void in the scientific literature, this study used the most recent available data from the Global Adult Tobacco Survey (GATS) to assess cigarette smoking prevalence and purchasing patterns among cigarette smokers aged 15 years or older in 19 LMICs.

METHODS

Sample

We used GATS data from 19 LMICs that conducted the survey during 2008–2012. GATS is a nationally representative household-based survey designed to measure tobacco use and other tobacco indicators among adults aged 15 years and older. The survey uses a standardized protocol to produce estimates that are comparable across countries. Additional details of GATS methods are available elsewhere[9, 23].

Measures

Smoking Status—Current cigarette smoking was defined by the question, —On average, how many of the following products do you currently smoke on each day? Also, let me know if you smoke the product, but not every day. In all countries, the products assessed included manufactured cigarettes (also referred to as —white cigarettes in Indonesia), hand-rolled cigarettes, pipes, cigars, shisha, and others. Additional products were assessed in some countries, including —kreteks (clove cigarettes) in Indonesia and —bidis (hand-rolled cigarettes in a tendu or temburni leaf that is tied with a cotton thread) in India and Bangladesh. For the purpose of this study, cigarette smokers were defined as persons who reported smoking manufactured cigarettes, white cigarettes, bidis, or kreteks daily or less than daily.

Purchase Location—Cigarette purchase location was determined by the question, —The last time you purchased [manufactured cigarettes] for yourself, where did you buy them? Response options included the following: (1) store; (2) street vendor; (3) kiosks; (4) military store; (5) vending machine; (6) duty-free shop; (7) outside the country; (8) Internet; or (9) from another person. Because of the limited sample size, the last five response options were collapsed into a single category. Response options for Brazil also included bars/taverns, restaurants, and gas stations, which were included in the *other* category.

Analysis

Each country's data were weighted to the national population and analyzed by using SPSS (Version 22.0) to account for the complex survey design. Percentages and 95% confidence intervals were calculated for the proportion of respondents who were current cigarette smokers. Purchase location was assessed among current cigarette smokers. Prevalence estimates based on fewer than 50 individuals were excluded because of large standard errors.

RESULTS

Results are presented in Table 1. Prevalence of current cigarette smoking in LMICs ranged from 3.7% in Nigeria to 38.5% in the Russian Federation (median = 21.9%). Among current cigarette smokers, the location of last purchase ranged as follows: stores, from 14.6% in Argentina to 98.7% in Bangladesh (median = 66.8%); kiosks, from 0.1% in Thailand to 77.3% in Argentina (median = 16.1%); street vendors, from 0% in Thailand to 35.7% in Vietnam (median = 3.0%); and for other locations, from 0.3% in China and Egypt to 57.5% in Brazil (median = 2.6%).

Among 7 of the 19 countries (Argentina, Bangladesh, China, India, Indonesia, Poland, and Uruguay), more than 20% of participants reported that a kiosk was the location of their last cigarette purchase. In Brazil, 57.5% of participants' last location of purchase are grouped as other, which included bars/taverns, restaurants, and gas stations.

Discussion

These findings reveal that the most common location where cigarettes were sold was in retail stores in all countries assessed, except Argentina, Indonesia, China, and Brazil. In contrast, kiosks were the most common location of last purchase of cigarettes by smokers in Argentina (77.3%), Indonesia (75.6%), and China (70.5%). In Brazil, about half of smokers (53.7%) made their last purchase from either a bar, tavern, or restaurant. Continued monitoring of purchase patterns of tobacco products could help guide the development, implementation, and sustainment of tobacco control strategies at the point-of-sale[24].

A large segment of smokers in some countries reported purchasing from street vendors, including India (16.5%), Nigeria (27.1%), and Vietnam (35.7%). It might be more challenging to conduct environmental scans or regulate tobacco sale activities among mobile vendors (e.g., street vendors) compared with vendors in fixed points-of-sale (e.g., kiosks or stores). A potential strategy to address such sales is licensure, which requires retail outlets to pay a registration fee to sell tobacco products[11]. Licensing could help control the number, type, and location of retailers[25], and allows for environmental scans on the number, distribution, and density of retail outlets[13, 14, 26]. Licensing could also be extended to street vendors, as there are efforts among this group to be organized and get recognition (27).

Regulating the tobacco retail environment is a new approach in many countries[28]. There has been progress in adopting tobacco retail regulatory policies to curb the supply side of tobacco, including in some of the countries in this study. For example, currently, 10 of the 19 countries assessed in this study prohibit point-of-sale advertising: Brazil, Bangladesh, Thailand, Poland, Russian Federation, Turkey, Ukraine, Egypt, Malaysia, and Vietnam[29, 30]. However, to date, the effect of specific interventions in this environment has not been studied extensively[31, 32]. On the other hand, emerging evidence suggests that tobacco retail regulatory strategies, such as tobacco licensing[33, 34, 35] and prohibition of point-of-sale advertising[27], may affect tobacco use.

As the tobacco control landscape continues to evolve in low- and middle-income countries, monitoring the retail environment to better understand patterns of access of tobacco products will be important, including emerging tobacco products, such as electronic cigarettes. Such data could help to formulate comprehensive tobacco control and prevention programs within countries and be useful to evaluate the effect of point-of-sale strategies, including licensing, enforcement, and retailer education[31].

Limitations

This study is subject to some limitations. First, there was some heterogeneity in the definition of *manufactured cigarettes*, which could introduce bias. For example, for India,

Bangladesh, and Indonesia, current cigarette smoking included manufactured cigarettes smokers and bidis or kreteks smokers. Second, the measure of the phrase, —the last time you purchased [manufactured cigarettes] for yourselfll refers to an indeterminate period in the past, which might differ systematically between daily and nondaily smokers. Long recall periods might render respondents particularly prone to forgetting or misreporting. More so, the question assessed for place of last purchase and not the *usual* purchase place, which may be more indicative of typical purchase patterns. Third, the study did not assess noncigarette tobacco use, including smokeless tobacco use. Finally, limited sample size made it necessary to combine multiple location options into the *other* category.

Conclusion

Stores and kiosks were major sources of cigarette purchases among cigarette smokers in most of the 19 LMICs assessed. Evidence-based tobacco retail policies, including those that reduce the availability, ease of access, and visibility of cigarettes could help reduce tobacco use, particularly among young people. In addition, monitoring the retail environment through store assessments and population surveys could help assess the effect of tobacco control strategies at the point-of-sale.

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What this paper adds

- This study identifies the last cigarette purchased location among current cigarette smokers in 19 low- and middle-income countries.
- The findings reveal that stores and kiosks were the main cigarette purchase locations in 18 of the 19 countries assessed.
- It is important to monitor the retail environment and exchange information on common cigarette purchased location and subsequent tobacco use to help guide tobacco control policy and practice.

Point-of-sale for last cigarette purchased by current cigarette smokers (aged older than 15 years), GATS 19 low- and middle-income countries, 2008–2012

Table 1

Countries	Current cigarette smokers ^{ab}	Overall sample size	Point-of-Sale Purchase Location			
			Store	Street vendor	Kiosk	Other ^c
	% (95% CI)	N	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Argentina (2012)	21.9 (19.0, 25.1)	1,637	14.6 (11.5, 18.4)	0.2 (0.1, 0.6)	77.3 (71.8, 82.0)	7.9 (5.0, 12.2)
Bangladesh (2009) ^f	22.5 (21.4, 23.6)	2,193	98.7 (97.8, 99.2)	0.5 (0.2, 1.1)	NA [§]	0.8 (0.4, 1.6)
Brazil (2008) ^{de,k}	11.5 (11.1, 12.0)	4,675	24.1 (22.6, 25.7)	2.3 (1.8, 2.9)	16.1 (14.7, 17.6)	57.5 (55.6, 59.5)
China (2010) ^{h,i}	26.7 (25.2, 28.2)	3,636	27.9 (21.8, 35.0)	1.3 (0.6, 2.9)	70.5 (63.1, 6.9)	0.3 (0.1, 0.8)
Egypt (2009)	16.3 (15.6, 16.9)	3,459	86.4 (84.3, 88.2)	NA [§]	13.3 (11.5, 15.4)	0.3 (0.1, 0.7)
India (2010)	12.5 (11.9, 13.0)	10,316	50.6 (47.2, 54.0)	16.5 (14.3, 19.0)	30.3 (27.1, 33.8)	2.6 (1.8, 3.6)
Indonesia (2011)	32.8 (31.2, 34.5)	2,657	20.8 (11.7, 34.3)	1.4 (0.2, 10.0)	75.6 (61.4, 85.7)	2.2 (0.6, 7.3)
Malaysia (2011) ^j	20.1 (18.2, 22.0)	807	90.6 (87.2, 93.2)	NA [§]	0.9 (0.3, 2.5)	8.6 (6.1, 11.9)
Mexico (2009)	15.6 (14.5, 16.8)	1,779	95.1 (93.5, 96.3)	2.8 (1.8, 4.4)	0.4 (0.1, 1.1)	1.7 (1.2, 2.5)
Nigeria (2012)	3.7 (3.2, 4.2)	417	56.1 (49.4, 62.6)	27.1 (22.0, 32.9)	15.7 (10.9, 22.0)	1.1 (0.4, 3.0)
Philippines (2009)	27.0 (25.8, 28.2)	2,619	96.2 (95.2, 97.0)	0.7 (0.4, 1.3)	NA [§]	3.1 (2.4, 4.0)
Poland (2010)	28.7 (27.5, 30.1)	2,285	52.0 (49.2, 54.9)	NA [§]	40.9 (38.2, 43.6)	7.1 (5.9, 8.6)
Romania (2011)	26.5 (24.8, 28.3)	1,047	84.3 (80.9, 87.2)	3.5 (2.2, 5.6)	6.6 (4.9, 8.9)	5.5 (4.3, 7.2)
Russian Fed. (2009) ^g	38.5 (37.2, 39.9)	4,734	66.8 (64.0, 69.5)	9.5 (7.9, 11.4)	19.4 (17.0, 22.0)	4.3 (3.4, 5.4)
Thailand (2009)	15.2 (14.3, 16.2)	2,799	98.5 (97.8, 98.9)	0.0 (0.0, 0.2)	0.1 (0.0, 0.3)	1.4 (1.0, 2.0)
Turkey (2012)	25.7 (24.5, 27.0)	2,279	91.3 (89.2, 93.0)	2.6 (1.6, 4.4)	4.3 (3.3, 5.7)	1.8 (1.0, 3.0)
Ukraine (2010)	28.5 (27.4, 29.7)	2,365	68.0 (65.1, 70.8)	3.0 (2.2, 4.1)	26.8 (24.1, 29.6)	2.2 (1.6, 3.1)
Uruguay (2009)	21.3 (19.8, 22.9)	1,090	62.4 (57.7, 66.8)	2.5 (1.5, 4.2)	25.7 (21.7, 30.3)	9.4 (7.4, 12.0)
Viet Nam (2010)	19.5 (18.4, 20.7)	1,874	59.9 (56.7, 63.0)	35.7 (32.6, 38.8)	1.4 (0.8, 2.3)	3.1 (2.1, 4.4)

^aUnweighted sample size for current cigarette smokers.

^bCurrent cigarette use refers to daily or less than daily cigarette smokers. This includes in some countries bids or kreteks. Current cigarette use does not include smoking roll-your-own cigarettes.

^cOther includes other sources, such as vending machine, military store, duty-free store, outside of the country/abroad, Internet, from another person, restaurant bar, and gas station. For Brazil, this includes included bars/taverns, restaurants, and gas stations were included in the other category.

^dKiosk includes bakery, snack bar with newspaper stall/newsstand.

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- ^eStore includes store, tobacco shop with supermarket, and grocery store with convenience store.
- ^fStore includes pan shop (e.g., specialty store which sells areca nut and betel leaf chewing tobacco).
- ^gKiosk includes post-exchange, newsstand, and tobacco kiosk
- ^hStore includes tobacco store/liquor store and store/supermarket.
- ⁱKiosk includes kiosk/gas station/convenience store.
- ^jStore includes grocery store, 24-hour convenience store and kiosk, supermarket, and road-side shop.
- ^kOther include bar, tavern or restaurant, gas station, free-shopping, internet and other §Data not available.