

## CHAPTER SEVEN

### **Cigarette/Tobacco Use and Exposure to Smoke in Latin America**

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Tobacco use is an extraordinarily complex problem with many recognized implications for physical and mental health (Breslau, 2004; Banham & Gilbody, 2010). In addition to a proven causal relationship with diseases including cancer, there is also evidence that people with psychopathological diagnoses such as schizophrenia, anxiety, and depression tend to smoke more regularly and impulsively, and with stronger cigarettes, thus becoming nicotine dependent more often (Dalack et al., 1998; Kao et al., 2011). Previous studies indicate smoking increases vulnerability to various mental health issues (e.g., Hall & Prochaska, 2009; Gutiérrez et al., 2012) including mood disorders, psychosis, and stress control, which in turn increase risk of dependence on nicotine and other substances (Karp et al., 2006; Gurillo et al., 2015).

According to the American Addictions Centers (2020), nicotine dependence is a major mental health problem because it is highly addictive both physically and psychologically, and therefore very difficult to quit. For this reason, nicotine dependence is classified in the DSM diagnostic system and addressed in treatment guides in clinical psychology. Breaking the habit is therefore beneficial for not just physical health, but also mental health (Royal College of Physicians & Royal College of Psychiatrists, 2013; Trebilcock & Corvalán, 2018).

While smoking is considered normal by many cultures around the world, its underlying behaviour chain is complex. It involves experimentation, initiation, expectations about personal and social effects, causal attributions of consumption, choice of brands, choice of when to smoke, level of physical dependence, social mediation, management of waste (boxes, cigarette butts, and ashes), and respect for restrictions in settings like school, shopping centres and sporting or cultural spaces (García-García et al., 2014; Gómez & Londoño, 2016).

According to the WHO (2020, a “smoker” is someone who has consumed at least one cigarette a day for the past month. But it is also necessary to take into account how the smoke is inhaled, and the health problems associated with it, as well as the number of attempts to quit or reduce consumption, when classifying smokers (Londoño et al., 2017; Becoña & Lorenzo, 2004). Londoño et al. (2011) and Londoño et al. (in press) classify levels of smoking as follows:

1. *Light consumption* entails occasional smoking, keeping the smoke in the mouth most of the time, with no more five cigarettes a week in social situations for more than six months (Londoño et al., in press). It involves initial positive attitudes towards smoking, maintaining use (Calleja, 2012; Chun, 2015), and using various brands (Pedraza et al., 2012; Londoño et al., 2020), without awareness of the negative effects of nicotine or any attempts to quit. The reasons for consumption are related to identity and social acceptance (Fernández, 2013). Smokers of this type have a permanent risk of escalation and subsequent harmful effects because they do not see themselves as real smokers due to their lack of deep inhalation and infrequent use (Holman et al., 2013).

2. *Moderate consumption* entails smoking between six and nine cigarettes a day, not only in social situations, for more than six months. They show signs of progressive deterioration of lung capacity manifesting in fatigue, tolerance starting to form, repeated self-administration (Martinez

& Saldarriaga, 2011), progressively increasing use (Londoño et al., in press), and mild anxiety from non-use causing a high risk of psychological and physical nicotine dependence (e.g., smoking even when sick).

3. *Heavy consumption* entails smoking between 10 and 19 cigarettes per day for more than six months, with most inhalations reaching the throat and sometimes the lungs (Londoño et al., in press), and subsequent health detriments including coughing fits, abundant phlegm, respiratory disease, frequent colds, and notable physical deterioration (National Cancer Institute, 2015). Heavy consumers experience intense and repeated desire to smoke and show significant signs of psychological dependence (Carní & Farre, 2003; López & Becoña, 2006). They regularly light their first cigarette in the first two hours of the day and tends to disregard prohibitions at smoke-free sites (WHO, 2013). To classify a heavy smoker, it is also a criterion that at least one healthcare professional has recommended quitting. They can pause it with the onset of physical symptoms but resume when those symptoms subside because one of the physical symptoms is that metabolizes cotinine and 3-hydroxycotinine and makes the absorption of nicotine faster. This makes addiction more likely and withdrawal syndrome more intense, causing greater rates of relapse (Lerman et al., 2007). Cessation leads to intense cravings, even in the absence of real neurochemical dependence (Kobiella et al., 2014; Potvin et al., 2015 Londoño et al., in press).

4. *Dependent consumption* entails smoking 20 or more cigarettes daily for more than six months, alone or accompanied, with deep lung inhalations, and exhibiting at least six signs of withdrawal when not smoking (distress, impatience, irritability, sweating, craving, lack of concentration, tension, anxiety, agitation, headache, and drowsiness) during the last six to 12 months (Huang et al., 2009; National Institute on Drug Abuse, 2014). The dependent smoker inhales deeply to improve nicotine absorption and responds quickly to context stimuli that

motivates to smoke (Velasco et al., 2017), does not self-regulate even in places with explicit restrictions, and has failed at attempts to quit (Londoño et al., in press). Cravings are more compelling than in other smokers and affect the performance of daily tasks. It has a remarkable detrimental effect on health, including the onset of chronic, non-communicable diseases like emphysema.

Besides the problem of smokers themselves, it is also necessary to consider the problem of second- and third-hand smoking. Exposure to second-hand smoke has been studied at all stages of the life cycle. In children, including the unborn, as it causes respiratory difficulties and low weight, among other problems (WHO, 2018). Second-hand exposure to tobacco smoke in the home, workplace, bars or restaurants is quite frequent, despite increased restrictions by the authorities in recent decades, because non-smokers are reluctant to tell their partners, family or friends they don't like smoking in their presence (Hyeongsu et al., 2014).

In general, smokers perceive others as more smokers than themselves and assess that their peers can expect and accept their smoking by the fact that they prefer to select a group of peers with similar behaviours, so having weak legislation against tobacco consumption can help the perception of acceptability of consumption to be greater (Azagba, 2015; Pischke et al., 2015; Popa et al., 2015). This acceptance and normalization of smoking may occur due to underestimation of actual tobacco smoking and exposure rates, so it is important to use objective measures in their assessment, and that of variables associated with it such as alcohol use and sociocultural beliefs or customs about the acceptability of smoking (Hyeongsu et al., 2014; Yoon et al., 2014).

Third-hand smoke describes tobacco residues left in the air, clothing, furniture, and structure of spaces after someone has smoked there, but without any direct contact with the smoker (Folan et al., 2013). These residues can remain in an enclosed space for several months (e.g., small

rooms and cars), exposing non-smokers to it even if the site has been cleaned or disinfected (Matt et al., 2011; Hang et al., 2013; Vitória et al., 2015; Roberts et al., 2017).

Many smokers accept that exposure to first-hand smoke (i.e., smoking itself) has negative effects on their health. They may also acknowledge the risk of exposing others (especially children) to second-hand and third-hand smoke, but this does not generally motivate them enough to quit (Suárez et al., 2013; Roberts et al., 2017). Therefore, it is important to promote more effective standards for protection against second-hand smoke, which are not based on the general belief that those who smoke alone and isolated can prevent other people from having harmful contact with tobacco. It is also important to develop research combining subjective data with biomedical indicators such as cotinine concentration.

## **Justification and Problem Statement**

Throughout human history, tobacco use has been accepted by countless cultural and social groups around the world. But the modern technological boom expanding access to various media has facilitated earlier onset and maintenance of smoking behaviour (National Cancer Institute, 2015)—although in recent history there has been a slight decrease (Parrado Corredor, 2013; WHO, 2014) due to restrictions on advertising cigarettes. However, there are media out of reach of such regulations such as the Internet in which there is advertising promoting cigarette use—and this has had a clear instigating effect on tobacco and other drug use in those who might only use experimentally 20 years ago (Kaya & Ünalan, 2010). Undoubtedly, rates of smoking remain high: at present approximately 30% of the global population over age 13 smokes (WHO, 2018).

Adding to this situation is the heightened rates of smoking in preadolescents, adolescents, and women—up to 55% of the population in some Latin American countries (e.g., Chile, Brazil, Costa Rica). In Colombia, the average age someone takes up smoking is under 13 (Gobierno de Colombia, 2018), and similar rates have been reported in countries such as Chile, Mexico, and the United States (Callejas, 2012; National Institute of Public Health of Mexico, 2009; Gaete & Araya, 2017). Starting to smoke during childhood increases the risk of eventual cancer, cardiovascular or metabolic diseases, psychoactive substance use, emotional disorders, academic failure, and social problems (Zurita & Álvaro, 2014; Guydish et al., 2015; Stiby et al., 2015). It also deteriorates one's general state of health in the medium and long term (Reynales-Shigematsu et al., 2007; Seung Hee & Stommelm, 2017; American Cancer Society, 2018). Early exposure to tobacco smoke also maintains and exacerbates consumption habits throughout life (Saddlesona et al., 2016). In this way, experimental use at an early age is associated with daily and high-volume cigarette smoking and frequent failed attempts to quit (Sargenta et al., 2017), as well as various risky behaviours that threaten health and well-being (Ansari-Moghaddam et al., 2016; Schreuders et al., 2017; Young & Shin, 2017).

Adolescent girls with weight and body image anxieties are more likely to start smoking at an early age because they believe smoking helps to control weight (Iakunchykova, 2015; Center for Disease Control and Prevention, 2020). On the other hand, smoking in men and adolescent boys is related to low emotional control and social competence, because they believe it increases their social skills and image, as promised by advertising and their social circle (Da Silva Reis dos Santos Ferreira et al., 2010). They also may believe it will optimize their sexual performance due to nicotine's calming effect on the nervous system (Pérez et al., 2012; Gaete & Araya, 2017)

Clearly, the negative impact of early tobacco use on young people's health is high, and there is no form that can be considered low risk—even for those who are not direct smokers (due to second- and third-hand smoke). This is compounded by the current lack of data on tobacco use and exposure in Latin America. It is intended to motivate the interested community in smoke prevention and open the door to effectively address this health problem (which also has social and environmental effects, among others) through the prevention of early-onset use and promotion of strategies to quit (Seung Hee, & Stommel, 2017).

## **Tobacco Use in Latin America**

For several years, cigarette consumption has been considered a public health problem in Latin America, where over a thousand people die every day from smoking, several of which are due to the effects of second- and third-hand smoke (Institute for Clinical and Healthcare Effectiveness, 2017). The WHO (2018) reported that the countries with the highest smoking rates were Bolivia (40%), Chile (37%), and Cuba (35%), followed by Uruguay and Argentina, (the latter two also reported the highest spending on care for the effects of consumption) (Giedion et al., 2010). Latin American countries are characterized by low capital inflows, and high poverty and inequality, conditions that encourage smoking—especially women and youth (Institute for Clinical and Healthcare Effectiveness, 2017). For this reason, one of the strategies adopted by the states has been higher tobacco taxes as a disincentive, but this has had little effect in countries such as Colombia, Bolivia and Argentina due to very low cigarette prices (Macrópolis Student Group, 2016).

## Peru

Tobacco is the second most prevalent drug in the Peruvian general population after alcohol, and the Ministry of Health registered more than 10,000 deaths per year in 2015 due to smoking initiated in adolescence, especially men who combine cigarettes and alcohol for social reasons (Rocío et al., 2015; Ministry of Health and Social Protection, 2016). This has prompted the National Commission for Development and Life Without Drugs (2017) to design policies concerning the supply/demand of tobacco and other illegal drugs, while the Ministry of Education (2019) has been working since 2004 on prevention in schools.

## Chile

Like Peru, Chile has one of the highest rates of tobacco use in Latin America. In response, they have also implemented various programs in adherence to the MPOWER plan of measures to prevent illnesses and deaths related to smoking (WHO, 2012). This plan is based in the Monitor tobacco use and prevention policies, protect people from tobacco smoke, Offer health to quit tobacco use, Warn about the dangers of tobacco, Enforce bans on tobacco advertising, promotion and sponsorship, Rise taxes on tobacco. The National Health Survey 2016-2017 of the Chilean Ministry of Health (2017) indicated about 6.233 of Chileans between age 20 and 29 were frequent cigarette users and had been smoking for 12 years on average. Further, 15.2% of people were exposed to smoke at home, and 20.3% at their workplace or school, resulting in more than one billion Chilean pesos in expenditures to treat related health problems (Pérez et al., 2016).



## **Mexico & Costa Rica**

Mexico also considers drug use—especially tobacco—to be a serious public health problem and has established timely and effective public policies such as MPOWER in response. The National Survey on the Consumption of Drugs, Alcohol and Tobacco 2016-2017 (National Commission against Addictions Mexico, 2017), indicated 43 thousand people died in 2016 and in 2017 from diseases attributable to smoking, representing 8.4% of all deaths in the country. Furthermore, it reported 4.9 million active smokers, with an average age at first use of 19 years (younger in men, older in women), and 14.1% of total population reported exposure to direct tobacco smoke at home. Similar statistics have been reported in Central American countries like Costa Rica, where 18.4% of smokers reported addictions to tobacco with annual growth trends close to 10% between 2008 and 2013 (Fonseca-Chávez et al., 2017).

## **Bolivia**

Tobacco consumption in Bolivia increased between 2011 and 2017, causing about 4.474 deaths per day. From related diseases tobacco kills 12 people per day (PAHO, 2011; IECS, 2017). Their response has included higher taxes on cigarettes establishing several types of smoke-free zones (e.g., public transport, restaurants, universities, etc.), highly salient health warnings on cigarette packs, treatment programs against tobacco use and dependence, as well as the technical program MPOWER (PAHO, 2011).

## **Cuba**

Cuba was among the three countries with the highest prevalence of smoking in Latin America as of 2017 (WHO, 2018). This may be associated with the country's high tobacco production, and that smoking has become an influential factor on social, cultural, political and economic relations (WHO, 2018). Consequently, 31% of Cubans were smokers—including more than 30% of health professionals—according to data collected in 2012 and 2014 (Casado et al., 2012; Suárez, 2014). Men comprised 71% of frequent smokers in Cuba, while 38.5% were women over 16 years of age. Between 2006 and 2012, approximately 6% of adolescents aged 13 to 15 smoked (WHO, 2013, 2014). Likewise, the death rate in Cuba due to smoking ranged from 15% to 18% between 1995 and 2007, with a mortality rate due to associated morbidity between 26% and 86%—data that were replicated in 2016 (Varona et al., 2016).

## **Colombia**

Colombia is no stranger to the public health problem of smoking. According to a joint report from their National Institute of Health and National Health Observatory in 2014, at least 300,000 people died annually from its effects on human health. At least three million were smokers overall (31.2% of women and 53.6% of men), with an approximate age of initiation around 12. On the other hand, 87.6% of them knew about the negative health consequences smoking, but none of them considered themselves to be at risk. Despite some control measures being in place, young people were able to purchase cigarettes in stores without any age restrictions (National Institute of Health, & National Health Observatory, 2014).

According to the National Study of Psychoactive Substances (Ministry of Health and Social Protection, 2016), smoking was one of the main risks factors for death in 65% of the

Colombian population, commonly resulting in lung, trachea and bronchial cancer. Children were reported to have a 40% chance of developing rhinitis and asthma at night or during physical activities (Ministry of Health and Social Protection, 2016). In pregnant women, exposure to tobacco could result in 13 to 19% lower birth weight, premature birth, and premature death in their children (National Institute of Health, & National Health Observatory, 2014).

## **Argentina**

Tobacco is the most widely used psychoactive substance after alcohol in Argentina, like mention in Peru. By 2005, the prevalence of consumption was 39% in adults and 30% in adolescents, with an onset of consumption between 12 and 14 (Bartolomé & Fernando, 2005). By 2012, the prevalence in adults was 34% (men more than women), and 24.1% in students aged 17 to 18 (Argentine Drug Observatory, 2016).

To combat smoking, the National Tobacco Control Program of the Argentine Ministry of Health and Environment developed social media strategies and educational campaigns to promote various social and economic anti-smoking initiatives. These included increased taxes and prices on tobacco, stronger restrictions on advertising, programs to help people quit smoking, the creation of smoke-free environments, promotion of healthy habits, and monitoring of indicators related to smoking (Ministry of Health and Environment, 2004). Likewise, the National Tobacco Control Law (Law, 26, 687) has decreased the use of tobacco by prohibiting its use, and restricting access to and advertising of tobacco (Argentine Drug Observatory, 2016).

## **Ecuador**

According to the National Institute of Statistics and Censuses (2010) in Ecuador, 4.5% of the population smoked (about 430 thousand people), the vast majority being men (85.5%). Of these, 37% had been smoking for more than 20 years, and just 1.7% for less than a year. In urban Guayaquil, people consumed an average of seven cigarettes a day, resulting in 707 deaths from cancer of the trachea, bronchi and lungs in 2009 (National Institute of Statistics and Censuses, 2010).

These data in Latin America indicate a need to intervene more effectively against the problem of smoking, since impact mitigation strategies that have been applied in all countries have not sufficiently mitigated these concerning statistics. Therefore, the objective of this study is to develop an overview of tobacco/cigarette consumption practices and exposure to smoke in Latin America and to compare them by country.

## **Method**

This is a descriptive, systematic observation and comparative study of tobacco consumption prevalence in Latin American countries.

## **Participants**

Participants were selected through convenience sampling and narrowed with multistage selection based on an initial interview about tobacco use, exposure to cigarette smoke, and desire to participate in the research. Consumption was evaluated through the application of survey

instruments. Power analysis indicated an estimated minimum sample of 136 per country for a power of .95 and a mean difference of .20 logits according to the Rasch Model.

**Table 1**

*Description of Sample Characteristics*

Variable	<i>F</i>	%
Total <i>N</i>	2149	
Age Range	18 to 81	
Mean Age	30.02	
Sex		
Men	1312	61
Women	837	39
Place of origin		
Argentina	134	10
Colombia	311	14
Costa Rica	255	12
Cuba	205	10
Ecuador	211	10
México	487	23
Perú	546	25
Occupation		
No information	3	0.1
Studies	858	39.9
Works	811	37.7
Unemployed	155	7.2
Studies works	277	12.9
Pensioner	45	2.1

The final sample included 2149 adults (age 18 to 81,  $M_{\text{age}} = 30.02$ ; 1312 male, 837 female), who were smokers with varying levels of consumption, from seven Latin American countries

(Table 1). Different sample sizes in each country were due to the varying difficulty of accessing smokers in those countries.

## Instruments

**Consumption Context Survey.** This scale consists of 17 items assessing the level of perceived risk of smoking and the degree of motivation to change based on the observation of health warnings (items 3, 5 and 69), the context of consumption (items 1, 4, 7, 8, 9, and 10), and the symptoms experienced (items 2a, 2b, 2c, 2d, 2e, 2f, 2g and 2h).

**Cigarette/Tobacco Consumer Classification Questionnaire C4 - R.** This measure was designed by Rodríguez, Londoño and Gantiva (2010), and adjusted and validated by Velasco, Londoño and Pardo (2018) in seven Latin American countries, showing an adequate level of internal consistency (.67) according to the interpretation rules of the Item Response Theory (Muñiz, 1997). It measures cigarette consumption and intensity of nicotine intake (concentration and depth of inhalation), also there are items about problems associated with consumption, and frequency of consumption.

## Procedure

The survey instruments were reviewed by the international team of researchers and the language was adjusted by country usage. Permission was obtained from educational and health centres in the participating countries to administer the instruments after obtaining informed consent. Descriptive, comparative and correlational data analyses were done with Winsteps® (Linacre, 2017) and AMOS® software. A trend analysis of positive protection responses to health warnings issued by international entities was carried out, and an index of the trend was calculated

by comparing values of monitoring standards for the control of direct and indirect exposure to smoke.

## Results

Of all smokers interviewed, 65.7% (1411) were classified as moderate risk consumers, 25.2% (541) were heavy consumers, 7.7% (165) were light consumers and only 1.5% (32) presented nicotine dependence. This pattern of distribution was maintained in Mexico, Peru, Ecuador and Costa Rica—but not in Cuba, Argentina or Colombia, where heavy smokers almost equaled the amount of moderate risk smokers (and surpassed in the case of Cuba). Meanwhile, Peru and Colombia had the largest proportions of people with nicotine dependence (Table 2).

**Table 2**

*Tobacco Consumption Levels in sample by Country*

Country	Level of Consumption							
	Dependent		Heavy		Moderate risk		Light	
	<i>F</i>	%	<i>F</i>	%	<i>F</i>	%	<i>F</i>	%
Argentina	5	3.7	62	46.3	66	49.3	1	0.7
Colombia	6	1.9	124	39.9	162	52.1	19	6.1
Costa Rica	0	0	28	11.0	207	81.2	20	7.8
Cuba	0	0	103	50.2	98	47.8	4	2.0
Ecuador	0	0	19	9.0	156	73.9	36	17.1
México	5	0.2	68	14.0	356	73.1	58	11.9
Perú	16	2.9	137	25.1	366	67.0	27	4.9
Total	32	1.5	541	25.2	1411	65.7	165	7.7

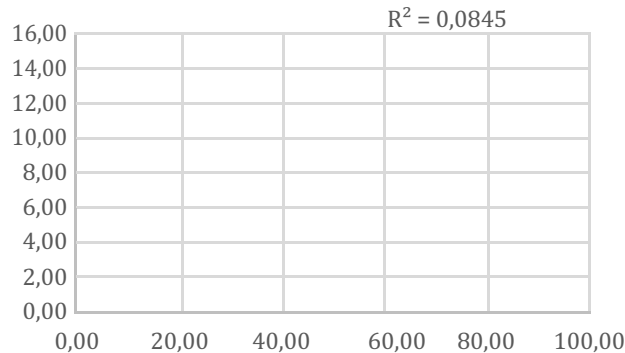
Regarding age, it was found that the accumulation shadow of moderate risk smokers in the graph had greater density in the area representing young people between 25 and 35 years,

and that heavy consumers showed greater density above 36 years. Figure 1 shows age on the horizontal axis and on the vertical axis the degree of consumption: the highest density of points represents respondents, smokers between 20 and 40 years old; which is ratified in the reported  $R^2$  (see Figure 1).

In terms of gender, men exhibited moderate and heavy consumption more frequently, while women had light consumption more often. There was no gender difference in dependence.

**Figure 1**

*Relationship Between Age and General Level of Consumption*



An impact index was calculated, that is, smoking can be seen as a risk factor associated with the incidence of exposure. The impact indices were generally lower than expected, indicating a low response to warnings in both directions. According to the consumer context survey, smokers in Colombia, Ecuador and Peru had the strongest response to health warnings—though still not very strong—while smokers from Argentina, Costa Rica, and especially Cuba, had the lowest indices (Table 3).



**Table 3**

*Response Rate to Health Warnings by Country*

Country	<i>N</i>	Index	<i>SD</i>	Min.	Max.
Argentina	134	1.16	.806	-3	2
Colombia	311	1.37	.697	-3	2
Costa Rica	255	.87	.953	-3	2
Cuba	205	.32	.667	-3	2
Ecuador	211	1.34	.695	0	2
Mexico	487	1.17	.950	-3	2
Peru	546	1.21	.991	-3	2
Total	2149	1.11	.920	-3	2

In terms of exposure to second- and third-hand smoke, the countries with the greatest control of exposure to smoke and the greatest attitude of smokers controlling their own exposure to second- and third-hand smoke (though still lower than expected) were Colombia, Ecuador and Peru, unlike countries such as Mexico, Costa Rica and Cuba, where smokers report low control of exposure to different types of smoke (see Table 4).

**Table 4**

*Second- and Third-Hand Smoke Exposure Control Index*

Country	<i>N</i>	Index	<i>SD</i>	Min.	Max.
Argentina	134	1.16	.806	-7	3
Colombia	311	1.37	.697	-7	3
Costa Rica	255	.87	.953	-7	3
Cuba	205	.32	.667	-7	3
Ecuador	211	1.34	.695	-7	3
México	487	1.17	.950	-7	3
Perú	546	1.21	.991	-7	3
Total	2149	1.11	.920	-7	3

## Discussion and Conclusions

The results show that in these seven Latin American countries, there is a greater trend of consumption in men than women, both in frequency and intensity. The latter report less frequent and less intense consumption, but not without risk to their health. This is consistent with previous studies carried out in the various countries (Bautista Pérez et al., 2016; Ministry of Health and Social Protection, 2015; Argentine Observatory of Drugs, 2016; PAHO & WHO, 2016; Institute of Clinical and Health Effectiveness, 2017; American Cancer Society, 2018). Likewise, there was a markedly higher rate of cigarette/tobacco consumption in women and young people likely due to the normalization of smoking, as reported in previous research (Institute for Clinical and Healthcare Effectiveness, 2017; Schofield et al., 2015).

In most countries, a majority of smokers were classified as moderate risk consumers, with heavy users next most common. However in Argentina and Colombia the proportions of moderate and heavy users were closer to equal, while in Cuba it was larger for heavy users. This represents a permanence of smoking habits in a greater proportion by heavy users and an increase in the number of cigarettes smoked, undoubtedly entailing significant risk to the health of smokers and those exposed to smoke in those nations. For this reason, the WHO (2017) has already noted the importance of paying special attention to smokers according to the number of cigarettes smoked and other characteristics such as the type of inhalation and associated problems (Londoño et al., 2017).

Moderate risk smokers and heavy smokers are characterized by smoking between 6 and 20 cigarettes per day, with little control of their consumption, and symptoms such as decreased lung capacity, coughing, and other respiratory conditions (National Cancer Institute, 2015). They have also developed tolerance to nicotine through repeated self-administration (Martínez & Saldarriaga, 2011). These patterns are associated with escalation of consumption due to anxiety experienced when deprived of cigarettes and recurring obsessive thoughts of smoking (Carní & Farre, 2003; López & Becoña, 2006).

Only 1.5% of smokers in our sample could be classified as nicotine dependent. This is in accordance with advanced pharmacological studies showing nicotine does not create strong physiological addiction, but rather a psychological one, due to the brevity of its neurochemical effects (Elias et al., 2018; American Lung Association, 2018),

Studies carried out by Becoña and Lorenzo (2004) and Gómez and Londoño (2017) in two different populations point in the same direction. In other words, successfully quitting smoking requires pharmacotherapy as well as behavioural intervention (Londoño et al., 2016).

This intervention must be accompanied by preventive actions to facilitate a social environment that promotes change, since people with nicotine dependence respond faster to responds quickly to context stimuli that motivates to smoke (Londoño et al., 2017).

A review of the results by country shows Mexico, Peru, Ecuador and Costa Rica, as well as the total sample, had a predominance of moderate consumption, just as previous research has shown (Institute for Clinical and Healthcare Effectiveness 2017; INEC, 2010), while Cuba and Argentina, and Colombia to a lesser degree, tended to have more similar proportions of heavy and moderate users. This may be partly explained by the fact that consumption is higher in countries where the Framework Convention proposed by the WHO (2005) has not been adopted, the economy of the region is related to tobacco production, and/or there is a culture rooted in the practice of smoking such as in the case in Cuba (Giedion et al., 2010; Casado et al., 2012; WHO, 2015).

For its part, Argentina is among the countries with the highest amount of spending on health associated with consumption, and Argentina and Colombia report lower prices for tobacco than the rest of Latin America (Macropolis Student Group, 2016), a situation that facilitates easy access to it, even for minors.

### **Exposure to Tobacco Smoke and Derived Products**

In general, most smokers have multiple vectors of exposure to tobacco smoke because they directly smoke it, while also being exposed to second- and third-hand smoke. Therefore, they have elevated risk of suffering from non-communicable diseases. However, research on this subject is poor and further developments are required on the subject. This frequent exposure

to smoke makes smokers feel less motivated to quit and are therefore less likely to do so (Businelle et al., 2010).

The countries with the highest index of attitude towards control of exposure to tobacco smoke are Colombia, Ecuador and Peru, while Mexico, Costa Rica and Cuba report less control attitude. Most of the countries have taken legal action to combat smoking and exposure to tobacco smoke, and this has had some effect. However, few have emphasized the prohibition of consumption in open spaces and in public places, or addressed the issue of exposure at home (Azagba, 2015; Fernández Arias et al., 2015; Fu et al., 2016).

In Colombia, Law 1335 regulates the exposure of people to tobacco smoke and its derivatives and acknowledges the right of people to protest when they are exposed against their will. However, because smokers are accustomed to being exposed to smoking by-products, they are overexposed to their own second- and third-hand smoke, and that of others, causing exponential growth of their risk (WHO, 2015). Other authors have noticed this overexposure problem (Hyeongsu et al., 2014; Azagba, 2015), without all due attention to the topic in the research. In such as Mexico and Peru, legislation has led to improved control of smoke exposure (Fernández et al., 2015), but with little impact on effective cessation.

The problem of smoking affects non-smokers who are exposed to environmental smoke with its potential damage to health—including children (PAHO & WHO, 2016). Cotinine in the blood of smokers and non-smokers alike is harmful for both because although there are lower concentrations in non-smokers, it does have negative effects on their health regardless of age and source of the smoke (Jain, 2016).

According to the verbal reports of the participants and the direct observation by researchers in this study, people in countries with less control of smoke exposure, smoke in

different contexts and times that are shared with non-smokers who are unwilling to confront smokers about it, just nit in the home, or in places like bars and clubs (Caballero Hidalgo & Pinilla Domínguez, 2014). Educational campaigns on the subject can help reduce smoke exposure, as exemplified by the policy implemented in the United States between 1999 and 2012 (Homa et al., 2015; Jain, 2016). Therefore, it has been suggested that non-smokers need to be educated about the need to express their disagreement with exposure to smoke in the home, workplaces, educational institutions, and elsewhere.

Smokers believe standing at the door of establishments or closing the door of the room where they smoke is sufficient to protect others from the smoke they produce, reducing their sense of responsibility about exposing others despite the fact that this is a highly ineffective measure (Roberts et al., 2017). This type of smoker tends to think others should accept their smoking (Azagba, 2015; Pischke et al., 2015; Popa et al., 2015) as a sign of tolerance (Hyeongsu et al., 2014; Yoon et al., 2014) and supposed respect for peaceful coexistence.

Further research is necessary on the perceptions and attitudes of non-smokers have to being exposed to tobacco smoke, and of their capacity to control it. It is also suggested to design effective strategies to sensitize both smokers and non-smokers about the danger of exposure to smoke in cars, public transport, and other closed spaces (Matt et al., 2011; Hang et al., 2013; Vitória et al., 2015).

## **Health Warnings**

In general, smokers in our sample did not respond much to warnings, as they did not avoid smoking or were not interested in their contents. Gómez and Londoño (2017), Muñoz and Sastre (2011), and Mae-Wood et al. (2010) found that smokers tend to cognitively and behaviourally

ignore messages that might cause negative feelings towards smoking, as occurs with photographs about the health impact of tobacco. Likewise, Qingua, Lochbuehler and Hornik (2017) noted only one in ten smokers considers quitting because of these warning images on packs.

Despite the efforts made by countries such as Colombia, Peru and Mexico in Latin America, there has been little response to the MPOWER program proposed by PAHO and WHO, which includes management of warnings to increase the perception of risk, promotion of quitting and development of prevention-care programs. And the response has been even lower in Costa Rica and Argentina, even when warnings are used (WHO & PAHO, 2016).

In the case of Cuba, the warnings are not included because while they have signed the treaty, they have not yet applied the program. This is probably associated with the maintenance of its culture and economy as one of the main producers of tobacco in the world. The case of Argentina is less clear: like Cuba, they signed the treaty but have not implemented the program, despite its cultural and economic conditions having little similarity to those of Cuba.

## Conclusions

In general, failure to control exposure to second- and third-hand smoke results in multiple levels of exposure to smoke for the population, and failure to use warnings in countries that have not signed the WHO-PAHO convention, or have simply not complied with its implementation (WHO, 2015). And beyond this, the effectiveness of these warnings appears to be limited.

High levels of exposure to tobacco smoke and its derivatives, low response to warnings, and the fact that there are multiple kinds of tobacco cigarettes available has heightened the risk to the smoking and non-smoking populations of Latin American countries to a worrying level.

In these conditions, non-smokers are at risk of becoming smokers (Lovato et al., 2011), and smokers are at risk of developing serious health conditions and dying prematurely. More must be done to combat this problem.



## References

- American Addiction Centers. (2020). *Most addictive drugs*. Retrieved from <https://americanaddictioncenters.org/adult-addiction-treatmentprograms/most-addictive/>
- American Cancer Society. (2018). *Riesgos para la salud según el tabaquismo [Health risks according to smoking]*. Retrieved from <https://www.cancer.org/es/cancer/causas-del-cancer/tabaco-y-cancer/riesgos-para-la->
- Ansari-Moghaddam, A., Rakhshani, F., Shahraki-Sanavi, F., Mohammadi, M., Miri-Bonjar, M., & Bakhshani, N. (2016). Prevalence and patterns of tobacco, alcohol, and drug use among Iranian adolescents: A meta-analysis of 58 studies. *Children and Youth Services Review, 60*, 68–79. <https://dx.doi.org/10.1016/j.childyouth.2015.11.018>
- Argentine Drug Observatory. (2016). *Informe epidemiológico sobre el consumo de tabaco en Argentina [Epidemiological report on tobacco consumption in Argentina]*. Retrieved from <https://www.observatorio.gov.ar/media/k2/attachments/InformeZEpidemiologicoZsobreZelZConsumoZdeZTabacoZenZArgentina.ZAbrilZ2016.pdf>
- Azagba, S. (2015). Effect of smoke-free patio policy of restaurants and bar o exposure to second-hand smoke. *Preventive Medicine, 76*, 74–78. <https://doi.org/10.1016/j.ypmed.2015.04.012>
- Banham, L., & Gilbody, S. (2010). Smoking cessation in severe mental illness: what works? *Addiction, 105*(7), 1176–1189. <https://doi.org/10.1111/j.1360-0443.2010.02946.x>
- Bartolomé, V., & Fernando, J. (2005). Epidemiología del tabaquismo en Argentina: Humo negro [Epidemiology of smoking in Argentina: Black smoke]. *Encrucijadas, 34*. Retrieved from [http://repositorioubasibi.uba.ar/gsd/collect/encruce/index/assoc/HWA\\_514.dir/514.PDF](http://repositorioubasibi.uba.ar/gsd/collect/encruce/index/assoc/HWA_514.dir/514.PDF)
- Bautista Pérez, F., Gómez Zetino, V., Aguilar de Mendoza, A., Herrador Vargas, M., & Alfaro Ramos, A. (2016). *Estudio de prevalencia del consumo de tabaco en estudiantes universitarios [Study of the prevalence of tobacco consumption in university students]*. Evangelical University of El Salvador. Retrieved from <https://hdl.handle.net/20.500.11885/188>
- Becoña, E., & Lorenzo, M. C. (2004). Evaluación de la conducta de fumar [Assessment of smoking behavior]. *Monografía Tabáquica, 16*(2), 201–226. Retrieved from <https://medes.com/publication/14336>
- Breslau, N., Novak, S. P., & Kessler, R. C. (2004). Psychiatric disorders and stages of smoking. *Biology Psychiatry, 55*(1), 69–76. [https://doi.org/10.1016/s0006-3223\(03\)00317-2](https://doi.org/10.1016/s0006-3223(03)00317-2)
- Businelle, M. S., Kendzor, D. E., Reitzel, L. R., Costello, T. J., Cofta-Woerpel, L., Li Y. ... & Wetter, D. W. (2010). Mechanisms linking socioeconomic status to smoking cessation: A structural equation modeling approach. *Health Psychology, 29*, 262–273. <https://doi.org/10.1037/a0019285>

- Caballero Hidalgo, A., & Pinilla Domínguez, J. (2014). Impacto sobre el consumo en bares, cafeterías y restaurantes de la modificación de la ley del tabaco española [Impact on consumption in bars, cafes and restaurants of the modification of the Spanish tobacco law]. *Gaceta Sanitaria*, 28(6), 456–460.  
<https://dx.doi.org/10.1016/j.gaceta.2014.05.006>
- Callejas, N. (2012). Medidas para el control del tabaco en México y en el mundo [Measures for tobacco control in Mexico and in the world]. *Enseñanza e Investigación en Psicología*, 17(1), 83–99. Retrieved from  
<https://www.redalyc.org/pdf/292/29223246006.pdf>
- Carní, J., & Farre, M (2003). Mechanisms of disease drug addiction. *The New England Journal of Medicine*, 975–986. <https://doi.org/10.1056/NEJM200312113492422>
- Casado, P., Arró, Y, & Arias, D. (2012). Repercusión del tabaquismo pasivo en el síndrome climatérico. Impact of passive smoking in climacteric syndrome]. *Revista Cubana de Higiene y Epidemiología*, 50(1), 104–117. Retrieved from  
[https://scielo.sld.cu/scielo.php?script=sci\\_arttext&pid=S1561-30032012000100013&lng=es&tlng=es](https://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S1561-30032012000100013&lng=es&tlng=es)
- Center for Disease Control and Prevention. (2020). *Smoking & tobacco use*. Retrieved from  
[https://www.cdc.gov/tobacco/data\\_statistics/fact\\_sheets/youth\\_data/tobacco\\_use/index.htm](https://www.cdc.gov/tobacco/data_statistics/fact_sheets/youth_data/tobacco_use/index.htm)
- Chilean Ministry of Health (2017). *Encuesta nacional de salud 2016-2017 [National Health Survey 2016-2017]*. Retrieved from  
[https://www.ipsuss.cl/ipsuss/site/artic/20171122/asocfile/20171122142253/ens\\_2016\\_17\\_primeros\\_resultados.pdf](https://www.ipsuss.cl/ipsuss/site/artic/20171122/asocfile/20171122142253/ens_2016_17_primeros_resultados.pdf)
- Chun, W. (2015). Determinants of tobacco use among Korean female adolescents: Longitudinal test of the theory of triadic influence. *Children and Youth Services Review*, 50, 83–87. <https://doi.org/10.1016/j.childyouth.2015.01.009>
- Corvalán, M. P., Véjar, M., Bambs, S., Pavié, G., Zagolin, B., & Cerda, L. (2017). Clinical practice guidelines for smoking cessation. *Revista Medica de Chile*, 145(11), 1471–1479. <https://dx.doi.org/10.4067/s0034-98872017001101471>
- Dalack, G. W., Healy, D. J., & Meador-Woodruff, J. H. (1998). Nicotine dependence in schizophrenia: clinical phenomena and laboratory findings. *American Journal of Psychiatry*, 155(11), 1490–1501. <https://doi.org/10.1176/ajp.155.11.1490>
- Da Silva Reis dos Santos Ferreira, M. M. & de Freitas Paúl Reis Torgal, M. L. (2010). Tobacco and Alcohol Consumption among Adolescents. *Revista Latino-americana de Enfermagem*, 18(2), 255–261. <https://doi.org/10.1590/s0104-11692010000200017>
- Elias, J., Hendlin, Y. H., & Ling, P. M. (2018). Public versus internal conceptions of addiction: An analysis of internal Philip Morris documents. *PLOS Medical*, 15(5), e1002562. <https://doi.org/10.1371/journal.pmed.1002562>
- Fernández, E. (2013). *Efectos de la utilización de personajes famosos en la publicidad televisiva de la ciudad de Quito (Tesis de pregrado)*. [Effects of the use of famous people in television advertising in the city of Quito (Undergraduate thesis)].  
<https://1library.co/document/q2n4g46q-efectos-utilizacion-personajes-famosos-publicidad-televisiva-ciudad-quito.html>

- Fernández Arias, I., García-Vera, M. P., & Sanz, J. (2015). Cuanta más psicología, mejor: eficacia para dejar de fumar de la terapia cognitiva conductual intensiva y de los parches de nicotina combinados con terapia cognitiva conductual intensiva y menos intensiva [The more psychology the better: smoking cessation efficacy of intensive cognitive behavioral therapy and nicotine patches combined with less intensive and intensive cognitive behavioral therapy]. *Clínica y Salud*, 25(1), 1–10. [https://scielo.isciii.es/scielo.php?script=sci\\_arttext&pid=S1130-52742014000100001](https://scielo.isciii.es/scielo.php?script=sci_arttext&pid=S1130-52742014000100001)
- Fernández, M., Artacho-Cordón, F., Freire, C., Pérez-Lobato, R., Calvente, I., Ramos, R.... & Olea, N. (2015). Trends in children's exposure to second-hand smoke in the INMA-Granada cohort: an evaluation of the Spanish anti-smoking law. *Environmental Research*, 138, 461–468. <https://dx.doi.org/10.1016/j.envres.2015.03.002>
- Folan, P., Fardellone, C., & Spatarella, A. (2013). *Tobacco Control Committee of the American Thoracic Society*.
- Fonseca-Chávez, S., Méndez-Muñoz, J., Guerrero López, C., & Reynales-Sigematsu, R. M. (2017). Tabaquismo en Costa Rica: susceptibilidad, consumo y dependencia [Smoking in Costa Rica: susceptibility, consumption and dependence]. *Salud Pública de México*, 59(1), S30–S39. Retrieved from <https://www.redalyc.org/pdf/106/10653144008.pdf>
- Gaete, J., & Araya, R. (2017). Individual and contextual factors associated with tobacco, alcohol, and cannabis use among Chilean adolescents: a multilevel study. *Journal of Adolescence*, 56, 166–178. <https://doi.org/10.1016/j.adolescence.2017.02.011>
- García-García, P., Vázquez-Galindo, L., Hayashida, M., & Santos, M. A. dos. (2014). Prevalencia y creencias en relación al consumo de tabaco en población universitaria [Prevalence and beliefs in relation to tobacco consumption in the university population]. *SMAD, Revista Eletrônica Saúde Mental Álcool e Drogas*, 10(3), 135–142. <https://dx.doi.org/10.11606/issn.1806-6976.v10i3p135-142>
- Giedion, U., Villar, M., & Ávila, A. (2010). *Los sistemas de salud en Latinoamérica y el papel del seguro privado. Instituto de Ciencias del Seguro [Health systems in Latin America and the role of private insurance. Institute of Insurance Sciences]*. Retrieved from <https://www.mapfre.com/ccm/content/documentos/fundacion/cs-seguro/libros/los-sistemas-de-salud-en-latinoamerica-y-el-papel-del-seguro-privado.pdf>
- Gobierno Nacional de la República de Colombia, Ministerio de Justicia y del Derecho, Observatorios de Drogas de Colombia, & el Ministerio de Salud y de Protección Social. (2013). *Estudio Nacional de consumo de sustancias Psicoactivas en Colombia Oficina de las Naciones Unidas contra la Droga y el Delito [National study on the use of psychoactive substances in Colombia United Nations Office on Drugs and Crime]*. UNDOC. CICAD. OEA. Retrieved from [https://www.unodc.org/documents/colombia/2014/Julio/Estudio\\_de\\_Consumo\\_UNODC.Pdf](https://www.unodc.org/documents/colombia/2014/Julio/Estudio_de_Consumo_UNODC.Pdf)
- Gómez, L., & Londoño, C. (2017). *Condiciones y factores de riesgo asociados al consumo de cigarrillo en población colombiana de 18 a 84 años de edad (Tesis de Maestría) [Conditions and risk factors associated with cigarette smoking in the Colombian population between 18 and 84 years of age (Master's Thesis)]*. Catholic University of Colombia.

- Gutiérrez, S., Casanova, J., Peña, B., & Vargas, M. (2012). Tabaquismo y trastorno mental grave: conceptualización, abordaje teórico y estudios de intervención [Smoking and severe mental disorder: conceptualization, theoretical approach and intervention studies]. *Revista de la Asociación Española de Neuropsiquiatría*, 32(116), 707–722. <https://dx.doi.org/10.4321/S0211-57352012000400003>
- Gurillo, P., Jauhar, S., Murray, R. M., & MacCabe, J. H. (2015). Does tobacco use cause psychosis? Systematic review and meta-analysis. *The Lancet Psychiatry*, 2(8), 718–725. Retrieved from <https://www.sciencedirect.com/science/article/pii/S2215036615001522>
- Guydish, J., Yu, J., Le, T., Pagano, A., & Delucchi, K. (2015). Predictors of tobacco use among New York state addiction treatment patients. *American Journal of Public Health*, 105(1), e57–e64. <https://doi.org/10.2105/AJPH.2014.302096>
- Hall, S. M. & Prochaska, J. J. (2009). Treatment of smokers with co-occurring disorders: emphasis on integration in mental health and addiction treatment settings. *Annual Review Clinical Psychology*, 5, 409–431. <https://doi.org/10.1146/annurev.clinpsy.032408.153614>
- Hang, B., Sarker, A., Havel, C., Saha, S., Hazra, T., Schick, S.... & Gundel, L. (2013). Thirdhand smoke causes DNA damage in human cell. *Mutagenesis*, 28(4) 381–391. <https://doi.org/10.1093/mutage/get013>
- Homa, D., Neff, L., King, B., Caraballo, R., Bunnell, R., Babb, S.... & Wang, L. (2015). Vital signs: disparities in nonsmokers' exposure to secondhand smoke--United States, 1999-2012. *Morbidity and Mortality Weekly Report*, 64(4) 103–108. <https://www.ncbi.nlm.nih.gov/pmc/articles/pmc4584848/>
- Holman, E., Bricker, B., & Comstock, S. (2013). Functional analytic psychotherapy and acceptance and commitment therapy for smoking cessation. *Behavior Therapy*, 42(4), 700–15. <https://doi.org/10.1016/j.beth.2011.03.002>
- Huang, C., Cheng, C., Lin, H., & Lu, C. (2009). Psychometric testing of the Chinese version of the Hooked on Nicotine Checklist in adolescents. *Journal of Adolescent Health*, 45(3), 281–285. <https://doi.org/10.1016/j.jadohealth.2009.02.012>
- Hyeongsu, K., Hofstetter, R., Hughes, S., Irvin, V., Kang, S., & Hovell, M. (2014). Changes in and factors affecting second-hand smoke exposure in nonsmoking Korean Americans in California: a panel study. *Asian Nursing Research*, 8(4), 313–318. <https://doi.org/10.1016/j.anr.2014.07.004>
- Iakunchykova, O. P. (2015). The impact of early life stress on risk of tobacco smoking initiation by adolescents. *Addictive Behaviors*, 50, 222–228. <https://dx.doi.org/10.1016/j.addbeh.2015.06.014>
- IECS. (2017). *El tabaquismo en Bolivia: muerte, enfermedad y situación impositiva [Smoking in Bolivia: Death, Illness and Tax Situation]*. Institute for Clinical and Healthcare Effectiveness. Retrieved from [https://www.iecs.org.ar/wp-content/uploads/Flyer\\_tabaquismo\\_bolivia.pdf](https://www.iecs.org.ar/wp-content/uploads/Flyer_tabaquismo_bolivia.pdf)
- Jain, R. (2016). Trends in exposure to second hand smoke at home among children and nonsmoker adolescents. *Science of the Total Environment*, 542(A), 144–152. <https://doi.org/10.1016/j.scitotenv.2015.10.076>

- Kao, Y. C., Liu, Y. P., Cheng, T. H., & Chou, M. K. (2011). Cigarette smoking in outpatients with chronic schizophrenia in Taiwan: relationships to socio-demographic and clinical characteristics. *Psychiatry Research, 190*(2–3), 193–199.  
<https://doi.org/10.1016/j.psychres.2011.05.016>
- Karp, I., O'Loughlin, J., Hanley, J., Tyndale, R. F., & Paradis, G. (2006). Risk factors for tobacco dependence in adolescent smokers. *Tobacco Control, 15*(3), 199–204.  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2564659/>
- Kaya, C. A., & Ünalán, P. C. (2010). Factors associated with adolescents' smoking experience and staying tobacco free. *Mental Health in Family Medicine, 7*, 145–153.  
<https://www.ncbi.nlm.nih.gov/pubmed/22477936>
- Kobiella, A., Ripke, S., Kroemer, N., Vollmert, C., Vollstadt-Klein, S., Ulshofer, D., & Smolka, M. (2014). Acute and chronic nicotine effects on behavior and brain activation during intertemporal decision making. *Addict Biology, 19*(5), 918–930.  
<https://doi.org/10.1111/adb.12057>
- León, D., Ferreira, P., & Pillon, S. (2010). Conocimientos y prácticas sobre el consumo de tabaco en estudiantes de pregrado de farmacia, Lima, Perú [Knowledge and practices on tobacco consumption in undergraduate pharmacy students, Lima, Peru]. *Revista Latino-americana de Enfermagem*. Retrieved from  
<https://www.scielo.br/pdf/rlae/v18nspe/a14v18nspe.pdf>
- Lerman, C., Schnoll, R., & Munafò, M. (2007). Genetics and smoking cessation improving outcomes in smokers at risk. *American Journal Prevention Medicine, 33*(6), S398–405. <https://doi.org/10.1016/j.amepre.2007.09.006>
- Linacre, J. M. (2016). *Winsteps® (Version 3.92.0)* [Computer Software]. Beaverton, OR: Winsteps.com. Available from <http://www.winsteps.com/>
- Londoño, C., Rodríguez, I., & Gantiva, C. (2011). Cuestionario para la clasificación de consumidores de cigarrillo (C4) para jóvenes [Questionnaire for the classification of cigarette consumers (C4) for young people]. *Diversitas: Perspectivas en Psicología, 7*, (2), 281–291. Retrieved from <https://www.redalyc.org/pdf/679/67922761006.pdf>
- Londoño, C., Velasco, M., & Pardo, C. (2020). Sistema de clasificación de consumidores de cigarrillo/tabaco [Cigarette/tobacco consumer classification system]. *Logos Vestigium*. Catholic University of Colombia.
- Londoño, C., Velasco, M., & Valencia, D. (2013). *Informe factores asociados al consumo de drogas en el Municipio de Sibaté [Report factors associated with drug use in the Municipality of Sibaté]* Limited access document.
- Londoño, C., Velasco, M., Gantiva, C., & Pardo, C. (2016). *Diseño y validación de un sistema de clasificación de fumadores a partir del C4. Informe avance proyecto institucional [Design and validation of a smoker classification system from C4 – Institutional project progress report]*. Catholic University of Colombia.
- Londoño, C., Pardo, C., & Velasco, M. (2017). *Diseño y validación del sistema de clasificación de fumadores a partir del C4. Informe Proyecto [Design and validation of the smoker classification system from C4 – Project Report]*. Catholic University of Colombia.
- López, M., & Nebot, M. (2003). *La medición de la nicotina como marcador aéreo del humo ambiental de tabaco [The measurement of nicotine as an air marker of second-hand smoke]*. Barcelona Public Health Agency. Retrieved from  
<https://scielosp.org/article/gs/2003.v17suppl3/15-22/es/>

- López, A., & Becoña, E. (2006). El craving en personas dependientes de la cocaína [Craving in cocaine-dependent people]. *Anales de Psicología*, 22(2), 205–211.
- López, M. & Nebot, M. (2003). *La medición de la nicotina como marcador aéreo del humo ambiental de tabaco [The measurement of nicotine as an air marker of second-hand smoke]*. Barcelona Public Health Agency. Retrieved from <https://www.scielosp.org/article/gs/2003.v17suppl3/15-22/>
- Lovato, C., Watts, A., & Stead, L. (2011). Impact of tobacco advertising and promotion on increasing adolescent smoking behaviours. *Cochrane Database System of Revision*, 5(10), CD003439. <https://doi.org/10.1002/14651858.CD003439.pub2>
- Macrópolis Student Group. (2016). *Memorias: Foro impuestos al tabaco en Latinoamérica [Memories: Forum on tobacco taxes in Latin America]*. National University of Colombia. Retrieved from <https://www.minsalud.gov.co/sites/rid/Lists/BibliotecaDigital/RIDE/DE/AS/Memorias-impuestos-tabaco-america-latina.pdf>
- Martínez, E. & Saldarriaga, R. (2011). Hábito de fumar y estilo de vida en una población urbana [Smoking habit and lifestyle in an urban population]. *Revista Facultad Nacional de Salud Pública*. 29(2), 163–169. Retrieved from <https://www.redalyc.org/html/120/12021450006/>
- Matt, G., Quintana, P., Zakarian, J., Fortmann, A., Chatfield, D., Hoh, E., Uribe, A., & Hovel, M. (2011). When smokers move out and non-smokers move in: residential third hand smoke pollution and exposure. *Tobacco Control*, 20(1), 1. <https://doi.org/10.1136/tc.2010.037382>
- Ministry of Health and Social Protection. (2015). *Herramientas para la prevención y control de enfermedades respiratorias crónicas [Tools for the prevention and control of chronic respiratory diseases]*. Programa Nacional de Clínicas de Cesación de Consumo de Tabaco. Convenio 519 de 2015. Documento de manejo interno [National Program for Tobacco Use Cessation Clinics. Agreement 519 of 2015. Internal management document].
- Ministry of Health and Social Protection. (2016). *Política de atención Integral en Salud. [Comprehensive Health Care Policy]*. <https://www.minsalud.gov.co/sites/rid/Lists/BibliotecaDigital/RIDE/DE/modelo>
- Ministry of Health and Environment. (2004). *Encuesta de tabaquismo en grandes ciudades de Argentina [Survey of smoking in large cities of Argentina]*. Retrieved from [https://www.msal.gob.ar/images/stories/bes/graficos/0000000019cnt-encuesta-tabaquismo\\_2004.pdf](https://www.msal.gob.ar/images/stories/bes/graficos/0000000019cnt-encuesta-tabaquismo_2004.pdf)
- Ministry of Education. (2019). *Lineamientos para la educación de una vida sin drogas [Guidelines for the education of a life without drugs]*. Retrieved from <https://tutoria.minedu.gob.pe/assets/lineamientos-para-una-vida-sin-drogas-baja.pdf>
- Muñiz, J. (1997). *Introducción a la Teoría de Respuesta a los Ítems [Introduction to Item Response Theory]*. Madrid: Pirámide.
- National Cancer Institute. (2015). Epidemia mundial de consumo de tabaco, una problemática en salud pública [Global epidemic of tobacco use, a public health problem]. *Hechos y Acciones*, 7(2), 1–14.

- National Commission against Addictions Mexico. (2017). *Encuesta Nacional de Consumo de Drogas, Alcohol y Tabaco (ENCODAT) 2016-2017*. [National Survey of Drug, Alcohol and Tobacco Consumption (ENCODAT) 2016-2017]. Retrieved from [https://www.gob.mx/cms/uploads/attachment/file/234856/CONSUMO\\_DE\\_DROGAS.pdf](https://www.gob.mx/cms/uploads/attachment/file/234856/CONSUMO_DE_DROGAS.pdf)
- National Commission for Development and Life without Drugs. (2017). *Estrategia Nacional de Lucha Contra Drogas 2017-2021* [National Strategy to Fight Drugs 2017-2021]. <https://cdn.www.gob.pe/uploads/document/file/2028729/ENLCD%202017-2021.pdf>
- National Institute of Health, & National Health Observatory. (2014). *Tercer Informe ONS: Mortalidad evitable en Colombia para 1998-2011* [Third WHO Report: Avoidable Mortality in Colombia for 1998-2011]. National Printing of Colombia, Bogotá, D.C., Colombia. Retrieved from <https://www.minsalud.gov.co/sites/rid/Lists/BibliotecaDigital/RIDE/IA/INS/Informe3-ME-ONS-Definitivo.pdf>
- National Institute of Public Health of Mexico. (2009). *Encuesta de tabaquismo en jóvenes de México, 2003-2005-2006-2008* [Youth smoking survey in Mexico, 2003-2005-2006-2008]. Retrieved from <https://www.conadic.salud.gob.mx/pdfs/pie/etj2008.pdf>
- National Institute of Statistics and Censuses. (2010). *Consumo de tabaco en Ecuador, Encuesta de Condición de Vida* [Tobacco Consumption in Ecuador, Living Condition Survey]. Retrieved from [https://www.ecuadorencifras.gob.ec/documentos/web-inec/Infografias-INEC/2012/Dia\\_tabaco.pdf](https://www.ecuadorencifras.gob.ec/documentos/web-inec/Infografias-INEC/2012/Dia_tabaco.pdf)
- National Institute on Drug Abuse. (2014). *The science of drug use and addiction: The basic*. <https://nida.nih.gov/publications/drugs-brains-behavior-science-addiction/preface>
- PAHO. (2011). *Bolivia: informe del control de tabaco* [Bolivia: tobacco control report]. Retrieved from [https://new.paho.org/hq/dmdocuments/2011/Bolivia\\_CR.pdf](https://new.paho.org/hq/dmdocuments/2011/Bolivia_CR.pdf)
- Pardo, C., & Piñeros, M. (2010). Consumo de tabaco en cinco ciudades de Colombia. Encuesta Mundial de Tabaquismo en Jóvenes [Tobacco use in five Colombian cities. World Youth Smoking Survey]. *Biomédica*, 30(4), 509–518. <https://doi.org/10.7705/biomedica.v30i4.289>
- Parrado Corredor, F. (2013). J. B. Watson y la publicidad, los inicios de la psicología del consumidor [J.B. Watson and advertising, the beginnings of consumer psychology]. *Revista Colombiana de Psicología*, 22(2), 401–406.
- Pedraza, J., Calderón, L., Cárdenas, L., & Agudelo, N. (2012). Tabaquismo en la población de 15 a 44 años de la ciudad de Tunja, Colombia [Smoking in the population aged 15 to 44 years of the city of Tunja, Colombia]. *Investigación y Educación en Enfermería*, 30(2), 245–252. Retrieved from <https://www.redalyc.org/articulo.oa?id=105224306010>
- Pérez, A., Martínez-Fernández, M., Redondo-Olmedilla, M., Álvarez, C., Jiménez I, & Mesa, I. (2012). Motivaciones para el consumo de tabaco entre los adolescentes de un instituto urbano [Motivations for tobacco use among adolescents in an urban institute]. *Gaceta Sanitaria*, 26(1), 51–57. Retrieved from [http://scielo.isciii.es/scielo.php?script=sci\\_arttext&pid=S0213-91112012000100009&lng=es&tlng=es](http://scielo.isciii.es/scielo.php?script=sci_arttext&pid=S0213-91112012000100009&lng=es&tlng=es)
- Pérez, F., Zetino, V., Aguilar de Mendoza, A., Vargas, M., & Ramos, A. (2016). *Estudio de prevalencia del consumo de tabaco en estudiantes universitarios* [Study of the prevalence of tobacco use in university students]. San Salvador, El Salvador.

- Pischke, C., Helmer, S., McAlaney, J., Bewick, B., Vriesacker, B., Van Hal, G.... & Zeeb, H. (2015). Normative misperceptions of tobacco use among university students in seven European countries: baseline findings of the “social norms intervention for the prevention of Polydrug use” study. *Addictive Behaviors*, *51*, 158–164. <https://doi.org/10.1016/j.addbeh.2015.07.012>
- Popa, D., Farcasiur, A., Voicu, B., & Rogozea, L. (2015). Characteristics of socio-economic context of the development tobacco addiction of students. *Procedia - Social and Behavioral Sciences*, *187*, 396–401. <https://doi.org/10.1016/j.sbspro.2015.03.074>
- Potvin, S., Tikász, A., Dinh-Williams, L. L., Bourque, J., & Mendrek, A. (2015). Cigarette cravings, impulsivity, and the brain. *Front Psychiatry*, *8*(6), 125. <https://doi.org/10.3389/fpsy.2015.00125>
- Qingua, Y., Lochbuehler, K., & Hornik, R. (2017). Does seeking e-cigarette information lead to vaping? Evidence from a national longitudinal survey of youth and young adults. *Health Communication*, *34*(3), 298–305. <https://doi.org/10.1080/10410236.2017.1407229>
- Reynales-Shigematsu, L. M., Vázquez-Grameix, J. H., & Lazcano-Ponce, E. (2007). Encuesta Mundial de Tabaquismo en Estudiantes de la Salud, México 2006 [World Survey of Smoking in Health Students, Mexico 2006]. *Salud Pública de México*, *49*(2), 194–204. <https://www.redalyc.org/pdf/106/10609009.pdf>
- Roberts, C., Wagler, G., & Carr, M. (2017). Environmental tobacco smoke: public perception of risks of exposing children to second- and third hand tobacco smoke. *Journal of Pediatric Health Care*, *31*(1), 7–13. <http://dx.doi.org/10.1016/j.pedhc.2016.08.008>
- Rocío, D., Lourdes, E., Edith, S., & Cortez, G. (2015). Perfil de los adolescentes frente al consumo de tabaco de un colegio nacional del distrito de Puente Piedra 2012 [Profile of adolescents regarding tobacco consumption in a national school in the Puente Piedra district 2012]. *Revista de Enfermería Herediana*, *8*(2), 127–132. <https://revistas.upch.edu.pe/index.php/RENH/article/view/2693>
- Royal College of Physicians, & Royal College of Psychiatrists. (2013). *Smoking and mental health*. London. <https://www.rcplondon.ac.uk/projects/outputs/smoking-and-mental-health>
- Saddlesona, M., Kozlowski, T., Giovino, G., Homisha, M., Mahoney, I., & Goniewicz, M. (2016). Assessing 30-day quantity-frequency of U.S. adolescent cigarette smoking as a predictor of adult smoking 14 years later. *Drug and Alcohol Dependence*, *162*, 92–98. <https://doi.org/10.1016/j.drugalcdep.2016.02.043>
- Sargenta, J., Gabrielli, J., Budney, A., Sonejia, S., & Wills, T. (2017). Adolescent smoking experimentation as a predictor of daily cigarette smoking. *Drug and Alcohol Dependence*, *175*, 55–59. <https://doi.org/10.1016/j.drugalcdep.2017.01.038>
- Schofield, T., Tarunna, S., Michelle, D., & Craig, A. (2015). Tobacco use among Aboriginal and Torres Strait Islander high school students: Understanding 'the social' and the effects of indigeneity. *Australian Aboriginal Studies*, *2*. Retrieved from <https://search.informit.org/doi/10.3316/INFORMIT.747204910375148>
- Schreuders, M., Nuyts, P., Van Den Putte, B., & Kunst, A. (2017). Understanding the impact of school tobacco policies on adolescent smoking behaviour: A realist review. *Social Science & Medicine*, *183*, 19–27. <https://dx.doi.org/10.1016/j.drugalcdep.2016.02.043>



- Seung Hee, C. & Stommel, M. (2017). Impact of age at smoking initiation on smoking related morbidity and all-cause mortality. *American Journal of Preventive Medicine*, 53(1), 33–41. <https://doi.org/10.1016/j.amepre.2016.12.009>
- Stiby, A. I., Hickman, M., Munafò, M. R., Heron, J., Yip, V. L., & Macleod, J. (2015). Adolescent cannabis and tobacco use and educational outcomes at age 16: birth cohort study. *Addiction*, 110(4), 658–668. <https://doi.org/10.1111/add.12827>
- Suárez, N. (2014). Mercado y consumo de cigarrillos en Cuba y la decisión entre tabaco o salud [Cigarette market and consumption in Cuba and the decision between tobacco or health]. *Revista Cubana de Salud Pública*, 40(3), 331–344. [http://scielo.sld.cu/scielo.php?script=sci\\_arttext&pid=S0864-34662014000300003](http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S0864-34662014000300003)
- Suárez, R. G., Galván, C., Oliva, C., Aquirre-Jaime, A., & Vásquez, C. (2013). Exposición al humo de tabaco del niño asmático y su asociación con la gravedad del asma [Exposure to tobacco smoke in asthmatic children and its association with the severity of asthma]. *Anales de Pediatría*, 78(1), 35–42. <https://doi.org/10.1016/j.anpedi.2011.12.008>
- Trebilcock, J., & Corvalán, M. (2018). Tabaquismo y Salud Mental [Smoking and Mental Health]. *Revista Chilena de Neuro-psiquiatría*, 56(3), 147–150. <https://dx.doi.org/10.4067/s0717-92272018000300147>
- Varona, P., García, G., García, M., & Lorenzo, E. (2016). Smoking and smoking risk perception in Cuban education, 2010-2011. *Revista Cubana de Salud Pública*, 42(1), 45–60. <https://www.scielosp.org/article/rcsp/2016.v42n1/o6/>
- Velasco, M., Londoño, C., Forero, M. F., Páez, D., Romero, M. & Ruíz, C. (2017). Identidad de consumo, motivos y creencias en jóvenes fumadores y no fumadores colombianos [Consumption identity, motives and beliefs in young Colombian smokers and non-smokers]. *Drugs and Addictive Behavior*, 2(2), 170–192. <https://doi.org/10.21501/24631779.2439>
- Vitória, P., Machado, J., Ravara, S., Araujo, A., Samorinha, C., Antunes, H., Rosas, M., Becoña, E., & Precioso, J. (2015). Portuguese children’s exposure to second-hand tobacco smoke in the family car. *Gaceta Sanitaria*, 29(2), 131–134. <https://dx.doi.org/10.1016/j.gaceta.2014.10.011>
- WHO. (2005). *Convenio Marco de la OMS para el Control de Tabaco [WHO Framework Convention on Tobacco Control]*. WHO Document Production Services. Geneva: Switzerland. Retrieved from [https://www.who.int/tobacco/framework/WHO\\_ftc\\_spanish.pdf](https://www.who.int/tobacco/framework/WHO_ftc_spanish.pdf)
- WHO. (2013). *2012 Informe mundial sobre los progresos realizados en la aplicación del Convenio Marco de la OMS para el Control del Tabaco. [2012 Global progress report on the implementation of the WHO Framework Convention on Tobacco Control]*. <https://apps.who.int/iris/handle/10665/79621>
- WHO. (2014). *Estadísticas Mundiales Sanitarias 2014 [World Health Statistics 2014]*. Retrieved from [http://apps.who.int/iris/bitstream/10665/131953/1/9789240692695\\_spa.pdf](http://apps.who.int/iris/bitstream/10665/131953/1/9789240692695_spa.pdf)
- WHO. (2015). *Informe OMS sobre la epidemia global de Tabaquismo [WHO report on the global epidemic of Smoking]*. Retrieved from [https://www.who.int/tobacco/global\\_report/2015/summary/es/](https://www.who.int/tobacco/global_report/2015/summary/es/)
- WHO. (2017). *Día Mundial sin tabaco: El tabaco es una amenaza para todos [World No Tobacco Day: Tobacco is a threat to everyone]*. Retrieved from <https://www.who.int/es/campaigns/world-no-tobacco-day/2022>

- WHO. (2018). *Campañas mundiales de salud pública de la OMS [WHO Global Public Health Campaigns]*. Retrieved from <https://www.who.int/es/campaigns>
- WHO. (2018). *Tabaco [Tobacco]*. <https://www.who.int/es/news-room/fact-sheets/detail/tobacco>
- WHO, & PAHO. (2016). *Informe sobre el control del tabaco en la región de las Américas [Report on tobacco control in the Americas region]*. Retrieved from [https://iris.paho.org/xmlui/bitstream/handle/123456789/28380/9789275318867\\_spa.pdf](https://iris.paho.org/xmlui/bitstream/handle/123456789/28380/9789275318867_spa.pdf)
- Yoon, B., Kyung, M., Hwa, E., Oh, J., Young, E., & Lee, D. (2014). Tolerance for and potential indicators of second-hand smoke exposure among nonsmokers: a comparison of self-reported and cotinine verified second-hand smoke exposure based on nationally representative data. *Preventive Medicine, 67*, 280–287. <https://dx.doi.org/10.1016/j.ypmed.2014.07.003>
- Young, K., & Shin, E. (2017). Bidirectional relationship between time preference and adolescent smoking and alcohol use: Evidence from longitudinal data. *Addictive Behaviors, 70*, 40–48. <https://dx.doi.org/10.1016/j.addbeh.2017.01.037>
- Zurita, F., & Álvaro, J. I. (2014). Repercusión del tabaco y alcohol sobre factores académicos y familiares en adolescentes [Repercussion of tobacco and alcohol on academic and family factors in adolescents]. *Salud y drogas, 14*(1), 59–70. Retrieved from <https://www.redalyc.org/pdf/839/83931686006.pdf>