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Impediments to tobacco harm reduction in LMICs:

The ENDS adoption journey

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Executive summary

Tobacco consumption has, for decades, represented a global pandemic. Over 1.3 billion people, or 16% of the world's population, use tobacco in one of its many forms, grouped into combustible or smokeless types. 80% of these users reside in low- and middle-income countries (LMICs) where tobacco use contributes to increased morbidity and mortality directly and indirectly, via poverty.

The Foundation for a Smoke Free World (FSFW) has a goal to advance progress in smoking cessation and tobacco harm reduction (THR) with a particular focus on LMICs. To better understand some of the challenges faced in these markets, FSFW commissioned Cambridge Design Partnership (CDP), a UK end-to-end innovation partner, to identify the barriers or impediments to adoption of electronic nicotine delivery systems (ENDS) in LMIC countries. ENDS, considered to be one of a number of reduced risk product types, have contributed to a reduction in rates of combustible tobacco use in developed markets, however, adoption in LMICs has been comparably low.

Through ethnography and qualitative fieldwork combined with quantitative surveys fielded in four LMICs (India, Indonesia, China and Russia), CDP was able to define an ENDS Adoption Journey which outlines seven steps a smoker must take to substitute combustible tobacco products with ENDS. The journey for smokers is undertaken in an environment defined by the unique social, cultural, economic, healthcare, regulatory and taxation landscapes of each market, serving to reduce or increase barriers at each step along the way. Quantitative research was also undertaken in the UK as a developed market 'control'. This served to highlight the relative height of barriers between LMICs and developed markets but also the absolute barriers faced by all smokers, no matter where they live.

Cover image: Mural in Panipat, India.

Whilst ENDS is used as an example here, the ENDS Adoption Journey is a model that can be re-framed in the context of other THR approaches. For each step of the journey, we set a question to prompt discussion on how the respective impediments, or barriers, may be tackled to help bring about THR in LMICs by ENDS or alternative means.

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Introduction

At the latest estimates, over 1.3 billion people worldwide consume tobacco products [1], whether combustible tobacco products such as factory-made (branded) cigarettes or cigars, roll-your-own cigarettes, local variants (e.g. kreteks – the most widely smoked cigarettes in Indonesia), cottage industry products (e.g. bidis or beedis– popular in India), or smokeless tobacco forms such as chewing tobacco and snus. 80% of these tobacco consumers reside in low- and middle-income countries (LMICs).[1]

Globally, tobacco is believed to be the cause of 8 million deaths each year[1]. However, in LMIC countries, the impact of tobacco goes beyond direct mortality, contributing to increased morbidity directly through diseases such as oral cancer, chronic obstructive pulmonary disease (COPD), heart disease, stroke and diabetes, and indirectly increasing morbidity and mortality through poverty and associated poor nutrition and sanitation. The individual and societal health burden is high.

Tobacco harm in numbers:
>1.3 billion people worldwide are tobacco consumers
>80% reside in LMIC countries, directly causing 8 million deaths per year

Against a backdrop of only slowly declining global combustible tobacco use, the FSFW was founded in 2017 with a clearly stated mission: “to end smoking in this generation” and with a particular focus on addressing smoking cessation and THR in LMIC countries.

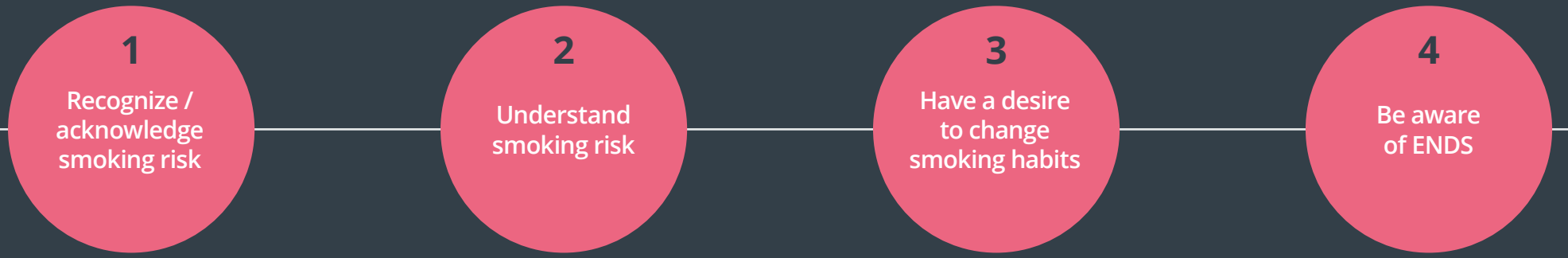
THR refers to reducing harm to the health of combustible tobacco users by encouraging the substitution of combustible tobacco products with other nicotine-yielding forms that do not rely on burning tobacco. These include: nicotine replacement therapy (NRT) products such as nicotine gums, sprays, pouches and patches; smokeless tobacco forms; and ENDS – more colloquially known as e-cigarettes or vapes. ENDS deliver nicotine through an electronic heating means, heating a nicotine-containing liquid (e-liquid) and thereby reducing exposure to toxic chemicals formed by combustion.[2] Public Health England (PHE) considers the estimate that ENDS are around 95% safer than smoking to be “reasonable”.[3]

In developed markets, use of ENDS has contributed to a reduction in the use of cigarettes and other combustible tobacco products. Whilst being driven by healthcare imperatives, a more empathetic appreciation of smokers in these markets as modern-day consumers – with increasingly demanding needs and expectations of choice – has transitioned some smokers to ENDS users. According to ASH (Action on Smoking and Health, a UK public health charity), of the 3.6 million ENDS users in the UK in 2021, just under two thirds are ex-smokers (31% are dual smokers and the remaining 5% have never smoked[4]). FSFW believes a greater emphasis on consumer-centric solutions could have a similar effect in LMIC countries, where the use of ENDS has, to date, been low.

In 2019, FSFW commissioned CDP to undertake a program of research focused on investigating the impediments to adoption of ENDS in LMICs and therefore their use in tobacco harm reduction. Members of the CDP team travelled to India, Indonesia, China and Russia to undertake immersive ethnographic research and in-depth interviews with smokers and smoking cessation advisors in large cities and smaller towns or rural environments. This qualitative research was supplemented with quantitative research comprising a survey fielded to 300 respondents in each LMIC market to test certain hypotheses, gain wider market understanding, and to compare and contrast smokers’ attitudes, beliefs, behaviors and needs to those of their counterparts in the UK, a leading ENDS adoption market where THR and smoking cessation strategies have had measurable success.

This white paper outlines some findings from the research and presents the ENDS Adoption Journey, a model developed by CDP to define the steps to ENDS adoption and the barriers that smokers in each market face, set within – and defined by – the unique social, cultural, economic, healthcare, regulatory and taxation landscapes of each. Such a presentation of this journey, which can be re-framed in the context of wider THR approaches, allows us to set a series of questions aimed at prompting discussion on the ways the status quo must change to reduce tobacco-related morbidity and mortality in LMIC markets through ENDS or other THR means.

The ENDS adoption journey (Figure 1)



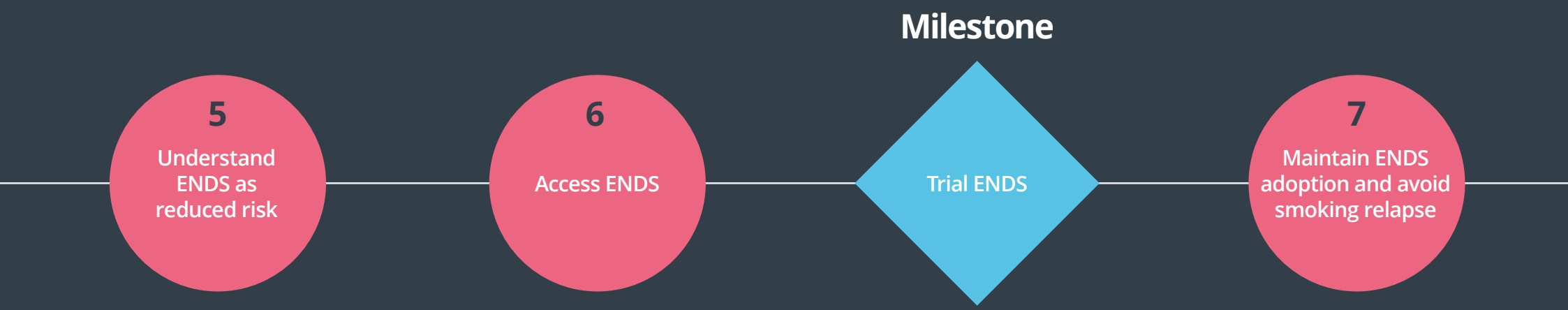
Seasoned marketers will be well aware of the buyers' journey, which describes the distinct steps that consumers and business-to-business buyers take on their way ultimately to purchase and re-purchase products and goods. Classically, these steps have been outlined as 1. Recognition of need 2. Information search 3. Evaluation of alternatives 4. Purchase decision 5. Post-purchase evaluation.

Here, we present a new variant that nuances the recognition of need, information search and evaluation steps when the market sector of interest is ENDS, known as reduced risk products, and the consumers are existing cigarette smokers. In this case, the recognition of need is intimately linked to a recognition and understanding of the risk to health that smoking presents and a desire to change habits on that premise. Information search and evaluation of alternatives considers awareness of ENDS and their role in risk reduction. Furthermore, in LMIC markets, where widespread product availability cannot be assumed, we include the consideration of consumers' ease of product access or purchase.

We call this modified journey the ENDS Adoption Journey, and it consists of seven steps as listed below and shown in Figure 1:

1. **Recognize/acknowledge smoking risk**
2. **Understand smoking risk**
3. **Have a desire to change smoking habits**
4. **Be aware of ENDS**
5. **Understand ENDS as reduced risk**
6. **Access ENDS**

   Milestone: **Trial ENDS**
7. **Maintain ENDS adoption and avoid smoking relapse**



Whilst these steps are generic and can be applied globally, the journey is experienced in a context that is unique to each country or market. External factors influence the consumer at each step, raising or lowering the barriers that they must surmount along the way. These factors include: social influences such as peer pressure and consumer-to-consumer misinformation and myth propagation; cultural influences such as deep-rooted ties to cigarettes, smoking and the tobacco industry; economic development which dictates mass-market affordability; public health and healthcare provision, impacting on smoking cessation resources and education; and regulatory and taxation forces that drive a range of factors including advertising and tobacco product accessibility.

In the remainder of this paper, we outline each ENDS Adoption Journey step in sequence and discuss the most interesting and relevant external influences in the context of the four LMIC markets studied here: India, Indonesia, China and Russia. We draw on findings from our own primary qualitative and quantitative research and other sources. For brevity, the term cigarettes is used to cover factory-made (branded) cigarettes, cigars, roll-your-own cigarettes, kreteks and bidis.

STEP 1

Recognize / acknowledge smoking risk

For ENDS to resonate and be an interesting proposition to smokers on the basis of reducing the risk associated with cigarette consumption, smokers must first recognize the absolute risk of this behavior. Reduced risk products of any form have little place in the minds of those who perceive no or low risk of cigarette smoking.

Evidence from CDP's primary quantitative research data suggests there is widespread recognition that, in general, cigarettes are harmful to smokers' health. Even in the market ranking lowest on this measurement (China), 87% of survey respondents agreed this was the case, with little variation between the LMIC markets and the UK 'control' overall. However, when respondents project this question onto their own circumstances, approximately three-quarters of those in India and Indonesia believe that they personally do not smoke enough for cigarettes to be harmful to them. They display self-exempting beliefs that are seemingly independent of the number of cigarettes smoked.

India and Indonesia represent the lowest and highest per person daily cigarette consumers, respectively, across the markets studied. 56% of respondents in India smoke five or fewer cigarettes (or equivalents such as bidis) per day, whilst in Indonesia, 54% smoke between 16 and 50 cigarettes per day.

Over 87% of smokers in each of the four LMIC markets believe that, in general, smoking is harmful to smokers' health, but approximately three-quarters in India and Indonesia believe it is not harmful to them personally

"People tell me it's harmful but it's not harmful to me! I've only coughed once this year."

CHINA

The element of denial is strong. Three-quarters of smokers in these same two countries (India and Indonesia), and 70% in China, also believe that there are no health benefits to giving up. Almost two-thirds in India (62%) and Indonesia (63%) believe that giving up smoking can actually be harmful to health.

Almost two-thirds of smokers in India and Indonesia believe that giving up smoking can be harmful to health

Opinions on passive or 'second-hand' smoking also display a strong self-exempting element. Smokers in all markets expressed certain mistruths or myths around this impact of smoking. Examples included rationalizing the notion that smoking was dangerous to non-smokers (or passive smokers) – but not smokers – on the basis that their lungs had not become used to the smoke in a way which smokers' lungs had, and suggesting that non-smokers inhaled through their noses and not predominantly through their mouths like smokers do, making passive smoking more harmful to them. Smoking myths are propagated amongst (smoking) friends, reinforcing incorrect beliefs and weakening an individuals' cigarette smoking cessation motivation.

"Passive smoking is worse than smoking. If my friend has a cigarette then I don't want to passive smoke, so I will smoke too."

INDONESIA

Finally, with the case of child passive smoking, there was acknowledgement that smoking in the presence of children should be avoided, and respondents explained that they would abstain totally or find a location out of sight and away from children when smoking. During ethnographic research, however, many instances of people smoking in front of their own children and grandchildren were observed. This was particularly notable in China. Qualitative research respondents talked of relatives, usually fathers and grandfathers, whom they had observed smoking, and who heavily influenced their own desire to try it for themselves. The smoking habit is completely normalized in Chinese society.

The qualitative and quantitative insight here points to the existence of cognitive dissonance amongst many smokers.[5,6] This is the emotional or psychological discomfort that a person feels when they hold two or more contradictory beliefs, attitudes, or values and perform actions that go against one of them. As a result, the person will have a tendency towards reducing this psychological discomfort by either changing their behavior or changing their belief, attitudes or value systems.

When presented with the evidence that smoking is unhealthy, a smoker who internally does not want to be unhealthy or 'at risk' will experience cognitive dissonance. As physically stopping smoking is difficult, this often results in the smoker changing their belief system to resolve the conflict and discomfort. A belief system can include functional beliefs (e.g. why smoking helps, for instance, increasing concentration – see Step 7) or risk-minimizing beliefs (e.g. beliefs that lower the severity of smoking in their minds). Meanwhile, many smokers can name an elderly relative who has been a heavy smoker throughout their life whilst relaying a story of their non-smoking acquaintance who died young, adding confirmation bias as a means to overcome their dissonance.

> *"I see a lot of people who don't smoke but they die young. Even some doctors smoke. I think the age of disease and death is the privilege of God."*
>
> INDONESIA

Cognitive dissonance presents a challenge to those looking to implement THR and smoking cessation strategies. It suggests written information and graphic on-pack warning imagery (Figure 2) alone cannot overcome the first hurdle smokers face. It is not that they do not recognize the risk of smoking; rather, they lack the acceptance that it applies to them.

Q How can we enable smokers to better internalize personal smoking risk?

Figure 2: Health warning on a cigarette pack in India **(top right)** and, less graphically if more explicitly, on a pack in China **(bottom right)**

STEP 2

Understand smoking risk

It is recognized by a number of public health bodies around the world, including The US Food and Drug Administration (FDA)[7], PHE[8], and The Royal College of Physicians (RCGP)[9], that nicotine, though itself not risk-free, is not the primary direct cause of smoking-related disease and morbidity. Rather, the greatest contributor is tobacco tar, a carcinogenic substance in burnt tobacco smoke which, when inhaled, can build up on the tissue of the lungs. A 1976 British Medical Journal paper put it this way: "People smoke cigarettes for the nicotine but die from the tar."[10]

Critical to smokers' adoption of ENDS as a replacement for cigarettes, on the basis of reduced risk, is the understanding that nicotine is not the greatest harm risk factor. This understanding cannot be taken for granted in LMIC countries or even more widely.

During our research, cigarette smokers were asked to identify (from a list) which agents were constituents of cigarettes or produced by smoking, which of those were harmful and which of those was most harmful.

The majority of smokers surveyed in China and Indonesia (57% and 64%, respectively) selected nicotine as being most harmful. This compared to approximately 15% (China) and 3% (Indonesia) selecting tar. Only in the UK was tar the highest-ranking harmful agent; selected by just under one-quarter of respondents.

"Nicotine is more harmful according to the propaganda I'm exposed to."

CHINA

"There is no protocol on who to prescribe NRT (nicotine replacement therapy) to and who not to. We tend to give them to chain-smokers as it can't do any harm, we would not recommend to less frequent smokers as it still contains nicotine."

INDIA HCP

More than half of smokers in Indonesia and China believe nicotine to be the most harmful substance produced by cigarettes

In India, just over 50% of those asked selected tobacco more generally as most harmful (10% selected nicotine and 7% tar).

In Indonesia and India, there is evidence of a high level of misunderstanding of tobacco harm and risk. Only 51% (Indonesia) and 31% (India) of respondents identified tar as being a product of cigarettes. It is worth noting that the inclusion of cigarette contents on the packaging is a regulatory requirement in both countries but enforced only in Indonesia.[11] There is correlation here, however, the degree of causation is unknown from this work in isolation.

Other work commissioned by FSFW[12] bears out the perception of harm that smokers associate with nicotine and suggests that it is relevant across a wide global span, including LMIC and developed countries. When over 17,000 smokers across 13 countries were asked to rate the harmfulness of moderate daily use of a number of substances (alcohol, caffeine, fat, salt, sugar and nicotine), nicotine scored most highly in all but one market. Only in India was it not top-rated, being secondary to alcohol in harm.

The role that educational and informational resources might have to play in positively influencing smokers' understanding is worth exploring. In 2020, Yang et al.[13] tested theories, such as Theory of Reasoned Action [14] and the Health Belief Model[15], which state that misperception about an issue can be addressed, and behavior changed, by messages that counter the misperception. The authors reported that smokers who were shown a nicotine fact sheet were twice as likely (compared to a control group) to disagree that nicotine is the primary cause of smoking-related disease. However, despite the test text stating explicitly that it was not the case, nearly three-quarters of the test cohort still considered nicotine to be the main cause of harm. The control group had set a low bar.

There is an education gap in LMICs concerning tobacco and its harm. In these markets, myths and hearsay can represent a considerable source of information. During CDP's qualitative research, many smoker stories begin with phrases such as "I was told that…." and "My friend says…" but considerably fewer of the form I read that…" and "I saw that…"

In China particularly, healthcare providers (HCPs) who acted in the capacity of smoking cessation advisors, felt strongly about the role that centralized and widespread education has to play in consumer perceptions of tobacco and harm. It was also evident that HCPs themselves were not necessarily equipped with the facts to support THR.

> *"In my mind, the support of the hospital is mostly about education. We need training. It is not professional enough."*
>
> CHINA HCP

> *"There should be more propaganda talking about the risks. We need to start the education with children – schools and family. Governments should take responsibility for education but the family can play a significant role."*
>
> CHINA HCP

As Yang has shown explicitly,[13] and market data tells us implicitly, information does not equal education. We should question the effectiveness of information in a vacuum, and there must be recognition that even structured and targeted communications will be consumed in a context of mixed messages, hearsay and internal biases.

Q **How can we better educate smokers and their influencers on the risks and causes of tobacco harm rather than just inform them?**

STEP 3

Have a desire to change smoking habits

The next step in the smoker's journey to adopting ENDS must be some acknowledgement that they wish to change their smoking habits. Our survey generated some intriguing data. Over 70% of respondents in any one market (India returning the lowest figure at 72% and Indonesia the highest at 88%) stated that they wanted to reduce the number of cigarettes they smoke, whilst at least 58% (ranging from 58% in India to 83% in Indonesia) said they wanted to quit completely. Just 10% (India) and 19% (Indonesia) had made a previous attempt to quit.

83% of smokers in Indonesia say they want to quit smoking; just 19% have attempted to

In Russia (69%) and China (55%), where sample sizes of those who had attempted to quit in the past were higher and provided scope for dissection, 'health' was the dominant theme amongst cited motivators. This was 'health' in terms of improving health and wellbeing, a reaction to a short-term illness, concerns of the impact that smoking was having on health (at the time) and could have in the future, and concerns on the impact on the health of family members around them. Financial motivations were more prominent in Russia, whilst requests from family to quit more so in China. Interestingly, almost one in four Chinese respondents cited the influence of something they had seen on TV and which had concerned them about smoking as a motivator.

"Cigarettes are expensive now. The price goes up and up. I said I will stop when the price hits 150 Rubles a pack, but it already has, and I still smoke."

RUSSIA

Of course, in order for smokers to adopt another product in place of combustible tobacco, they must have an innate desire to want to quit cigarettes or be exposed to an overwhelming external influence; however, these motivations represent just one input into the decision-making process that consumers go through in their day-to-day when making purchasing choices.

The decision-making process of consumers to switch from one product to another can be conceptualized in a model of competing intrinsic and external forces (Figure 3). For a consumer to ultimately switch, the forces that are maintaining the status quo must be overcome by forces that will cause change.

On the status quo side of the equation (right in Figure 3), there is allegiance to a current solution and anxiety of a new one. Allegiance is typically a function of satisfaction with which the product is meeting functional, emotional and social needs and brand loyalty (itself a function of these needs – particularly those with an emotional basis). In the case of cigarette smoking, the special case of nicotine addiction can also be included as can, albeit to a lesser extent, addiction to the habits associated with smoking, such as removing the cellophane wrapper, tapping the cigarette on the box to disperse the tobacco, and flicking the cigarette lighter (see Step 7).

Anxiety represents the doubts that the consumer has about the unknown future. It is the "but what if...?". The switch is a leap of faith. Notwithstanding the impact of cognitive dissonance, we have seen earlier in this paper that smokers hear tales of the harm that giving up cigarettes might cause, some of the tales even reportedly emanating from healthcare professionals, whilst potential weight gain is an oft-cited barrier to overcome.

On the change side of the equation (left in Figure 3), there are push forces of the current situation which provide motivation to change, such as the disapproval of a spouse, a concern for future health, and financial pinches. Also, there are pull forces which are generated by the benefits of the potential replacement(s). Perhaps a less-polluting solution could be more attractive if there is an imminent arrival of a baby into the family.

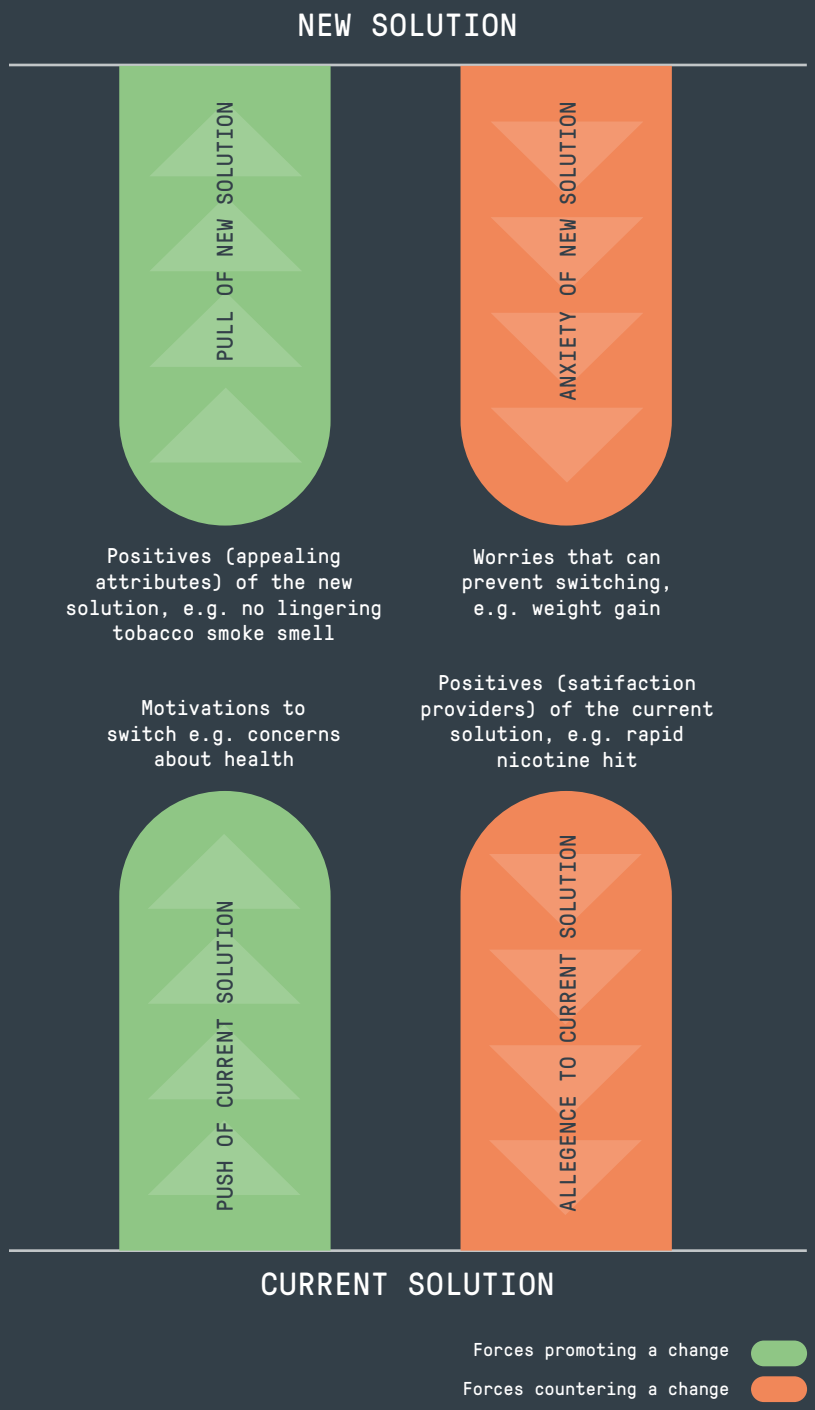


Figure 3: Internal and external influences on consumers when switching their behavior **(right).**

For innovators, countering allegiance to current products and behaviors is challenging. Others, particularly brand owners, may have strived hard, at significant expense, to build an allegiance in the first place. In Indonesia, where tobacco advertising is widespread, both on TV and in the street scene, smokers are consistently exposed to messages promoting success and aspirational heights that smoking cigarettes is purported to bring.

Advertising campaigns in Indonesia at the time of fieldwork ran with straplines such as “NEVER QUIT” set against a backdrop of high-octane sporting and action endeavor. “DON’T QUIT”, said the adverts for another brand whilst “LIVE LEARN LEAD” is how one chooses to capture and keep the attention and loyalty of customers.

Almost 80% of Indonesian smokers surveyed agreed that the brand of cigarette they smoked was part of their identity. An emotional attachment to brand, to cigarettes and smoking is highest here of all markets tested. That presents a tough barrier for new entrants to overcome.

> *““I see brands on display in store, on posters, on TV advertisements, in newspapers. I hear them on the radio…”*
>
> INDONESIA

In China, messaging is perhaps more subtle though powerful nonetheless. Cigarette packaging, even for some lower-priced products, projects premium elements, using traditional local and Chinese national imagery with red (symbol of good fortune) and gold (symbol of wealth and prosperity) featuring heavily. Meanwhile, names translate to positive meanings, such as Pride, Double-Happiness and Good Day.

Images: On-street tobacco advertising in Bogor **(top)** and Jakarta, Indonesia **(bottom)**.

"When I was younger, I'd be attracted by the fancy packages. The package is important."

CHINA

Brands and their agencies are not working alone in reinforcing the allegiance to smoking. Social and cultural influences can be strong in some countries. For example, gifting of cigarettes is a deep-rooted and pervasive part of Chinese culture. It is a widespread and important custom in both a social and business context. Over 70% of adults in a 2018 Chinese survey[16] had gifted cigarettes for the Spring Festival during the previous year, 30% had gifted for a business event, whilst less than 5% had not gifted any cigarettes for any reason.

Presenting and sharing a premium brand of cigarettes when smoking as a group or gifting a premium carton of cigarettes is seen as a symbol of status and generosity. Gifting cartons of cigarettes is a norm for social and cultural interactions: as a thank you, when eliciting someone's help, or for celebrations. Turning down a cigarette can be interpreted as a rejection of the brand of a cigarette being offered, thereby potentially offending the person offering.

"If I need to smoke with my clients, I have expensive cigarettes. I stock up."

CHINA

"It's common in socializing and it's good etiquette. It can facilitate our conversation. If I don't offer cigarettes to others it's embarrassing. It's a culture."

CHINA

"I will sometimes send cigarettes as gifts to colleagues."

CHINA

Image: An adverting billboard in Bogor, Indonesia.

Chinese culture upholds a very strong sense of community. This presents many opportunities and trigger points for smoking alongside communal social activities. During ethnographic research, many people were observed smoking whilst playing Mahjong, Chinese chess and cards, articulated as occasions of increased consumption. Friends and acquaintances can also be a negative influence on smokers trying to quit. One in five smokers surveyed in China said they asked friends and family for support and encouragement when trying to quit. However, when it came to sustaining cigarette abstinence, we also heard stories of how friends, colleagues and associates had generated strong forces back to smoking, either through passive influences or even active persuasion.

> *"I smoke more when I play Mahjong. I just keep smoking one after another. Every player is smoking."*
>
> CHINA

Smoking is viewed as a natural partner to alcohol and perhaps is linked as strongly with the Chinese culture as tea. It is a deeply ingrained cultural habit for men, in particular, and is used by both genders as a means to break down social and communication barriers whilst providing a common bond on which relationships, in both social and business contexts, can be forged and cemented. Although it is not a neuro-chemical addiction, it is likely there is still an element of associative behavior at play that sees drinking as a strong trigger for smoking.

> *"In China... to be honest smoking and drinking are something that you have to do when you want to socialize and have more business... that's why I started again."*
>
> CHINA

Although there are provincial laws banning smoking in certain public places in China, it was evident during ethnographic research that these laws are not strictly adhered to. In particular, it was observed to be widespread in restaurants and bars. The perception was that fines issued to premises owners are so low as to render the bans near meaningless.

Images: A female smoker in a bar in Guangzhou, China **(left)**. Friends playing Mahjong in Qingyuan, China **(right)**.

Few women were observed smoking outdoors. However, in a bar setting, women smokers were represented much more strongly, perhaps because it was felt to be a more socially acceptable female smoking environment in which women are more likely to be surrounded by like-minded people. In our survey, 92% of Chinese survey respondents suggested that it is more acceptable for men to smoke cigarettes than for women.

In Russia, as in China, the complementary effect of cigarettes and alcohol plays a role in the consumption of the former. Some 58% of survey respondents in Russia stated that they smoke when drinking alcohol (36% in China). In both markets, close to two-thirds of respondents cited socializing as a smoking occasion.

> *"The most indulgent cigarette is the one with friends and the one with alcohol."*
>
> RUSSIA

In Indonesia, a different picture was observed. Indonesia has the largest Muslim population in the world (and thus lower levels of alcohol consumption) whilst being one of the world's largest producers of coffee. Coffee consumption is part of everyday life and, as a result, coffee rather than alcohol is seen as the perfect bedfellow to cigarettes.

> *"I'll always have cigarette with coffee, without coffee it just doesn't feel right. They are pairs of each other, they're companions."*
>
> INDONESIA

> *"When I hang out with my friends at the markets and with customers, we chit chat. I will always have a cigarette with a coffee."*
>
> INDONESIA

Clearly, there are common stimulant properties and similarities in sensorial similarities, such as levels of spiciness, sweetness, harshness, between coffee and tobacco, but the positive and rewarding associations between the two products can only be reinforced in the minds of smokers by the fact that there is an additional social dimension to this relationship.

Smoking in Indonesia is considered to be a 'machismo' pastime. Many male respondents alluded to this, talking about how their initiations into smoking were often driven by social groups applying peer pressure and goading them into participating with comments of "if you don't smoke, you're not a man". The opposite was equally true from the female perspective. Many of the female research participants talked about a reluctance to be seen smoking in public.

> *"Girls with hijabs are seen as 'good girls', smoking doesn't really fit with that."*
>
> INDONESIA

During the fieldwork, the only time the team directly witnessed females smoking openly in Indonesia was at a café in a social 'chit-chat' context. As with China, it is perhaps this social dimension and dynamic that helps overcome the female social smoking taboo.

Amongst the concerned markets, India is characterized by low per-person cigarette consumption. Some 56% of smokers said they smoke one to five cigarettes per day, however, 50% of those chose to do so when socializing. Smoking is an integral part of Indonesian culture and is often enjoyed with friends as part of social situations. As in India and China, observations of women smoking in public were few and far between. Those participating in the qualitative research stated that they felt more confident smoking in a social setting.

Referring back to the switching model in Figure 3, the greatest play, and where most external influence can be applied to the smoker, is through the pull of new products, by making them so attractive as to overcome allegiance to cigarettes, complementing any internally generated push forces that may open the window of opportunity, and easing the anxiety of change. For smokers to switch to another product, that product must strongly outperform cigarettes on those motivational dimensions. These will be the subject of the conversation in Step 7.

Q **Can ENDS combat the apparently often overwhelming forces that keep smokers smoking?**

Image: A coffee and smoking break in Jakarta, Indonesia.

STEP 4

Be aware of ENDS

In developed markets, particularly in the UK and US, ENDS have been commonplace in society for some time, and there is a high general public awareness of their existence. Large vapor plumes emanating from passers-by in the street or out of a car window are oft-seen tell-tale signs of their use in these markets.

In the LMIC countries studied here, awareness of ENDS was mixed – even amongst tobacco users – and it was clear that there is local variation in terminology used to describe them. Awareness of ENDS was high in Russia and China, where 85% and 83%, respectively, stated that they were aware of "e-cigarettes" or "vapes" with e-cigarette being a more widely known term in both markets. Awareness in India and Indonesia was considerably lower. Just over one-quarter (27%) of Indonesians had heard of e-cigarettes or vapes (the dominant term). In India, just 12% claimed to have done so.

Awareness of ENDS is not a given in LMIC markets. In Indonesia, just over one-quarter of smokers surveyed said they knew of e-cigarettes or vapes. This figure was just 12% for Indian smokers

Image: Advertisement for a ENDS shop in Moscow, Russia.

Regulations governing ENDS advertising are variable across the globe and across our markets of interest and, indeed, the regulatory landscape in India and China was in a state of flux during the course of the work described here. Advertising of ENDS in India was not restricted until the Government put in place a ban on their sale and use in September 2019 with a strong justification to deter use among young people[17], whilst the Chinese government announced their own ban on online advertising and sales in November 2019[18], just one month after the completion of our fieldwork. Until that time, ENDS could be marketed without major limitations.

> *"The awareness of e-cigarettes is not good yet so it can be difficult to get hold of them."*
>
> CHINA

Shortly after, in July 2020, the Russian Federal Government approved new amendments to the Tobacco Control Law in Russia (effective since January 2021) to unify the regulation of tobacco and other nicotine products such that the advertising, promotion, sponsorship by and demonstration of nicotine products would also be prohibited.[19] Only in the case of products registered as medical devices and medicines do exceptions apply.

Speaking at the Global Forum for Nicotine in summer 2021, Nataliia Toropova (a former Program Manager at WHO and now an international adviser on policy and public advocacy with a focus on the Russian Federation and post-Soviet states) highlighted equalization of ENDS and tobacco regulations as one of the significant barriers to ENDS adoption in LMIC countries.

In Indonesia, ENDS advertising remains largely unrestricted, being prohibited only in those areas where use is also outlawed.

Q Does the harmonization of combustible tobacco and ENDS regulation serve to help or hinder global THR initiatives?

STEP 5

Understand ENDS as reduced risk

Once a smoker is aware of the existence of ENDS, the next step in their ENDS Adoption Journey is to recognize and understand ENDS as representing reduced risk. Navigating the barrier in this step is done whilst under the constant bombardment of factors acting to crank the barrier ever higher.

It is perfectly understandable that people will struggle with drawing the distinction between a cigarette and an e-cigarette on the basis of safety. "It is still a cigarette, right?". Meanwhile, even amongst healthcare practitioners tasked with providing smoking cessation support, tobacco harm is not completely understood, and the quality of clinical evidence in support of ENDS is still considered to be insufficient.

> *"I would not recommend e-cigarettes as a doctor. According to the literature they are just as harmful."*
>
> CHINA HCP

> *"I need a double-blinded clinical trial and follow-up over a long time. Smokers on e-cigarettes, smokers on traditional cigs... I know it's difficult to manage the variants. There is less tar but nicotine is still very harmful. No manufacturer of e-cigarettes would want to invest the amount of money needed."*
>
> CHINA HCP

Nataliia Toropova, speaking to CDP in September 2021, re-emphasized this point. "One of the major obstacles is that there is a tobacco industry behind this product [ENDS], and this fact turns out to be striking and demotivating for many smokers as well as for key stakeholders like doctors, policy makers, scientists, etc. This is something that needs a special strategy and tactic to deal with."

In fact, the challenge is more extreme than people simply not drawing a distinction between the relative harm of ENDS and combustible tobacco products. There is good evidence to suggest that significant proportions of smokers in LMIC markets believe that ENDS are more harmful than cigarettes. In Russia, this is some 30% and, in China, it is 47% (base is those who know the term 'e-cigarettes'). There are multiple sources of these perceptions. Much, particularly in China, comes from explicit reports that support them.

> *"I've watched a TV news report that told me that e-cigarettes are more harmful, they're banned already in Hong Kong."*
>
> CHINA

> *"There are a lot of negative e-cigarette reports. In terms of e-cigarettes, I have a lot of concerns as a doctor. E-cigarettes are more or less similar to normal cigarettes."*
>
> CHINA HCP

Considering Indonesia, where vape is the dominant term, it could by hypothesized that an explicit link to vapor would elicit thoughts of reduced harm. This was not shown to be the case. 80% of those who are aware of vapes consider them to be more harmful than cigarettes. The vapor emanating from ENDS was often referred to as smoke.

Some relationship between ENDS and harm stems from the contrasting associations of ENDS with chemicals (through the notion of e-liquids and 'artificial' flavors) and tobacco with naturalness and the knock-on association of provenance.

> *"I also heard that vapes are more dangerous, but that depends on the liquid. You don't know if the liquid is legal or not. We don't know what's in the liquid, but all tobacco is the same."*
>
> INDONESIA

It is noteworthy that the fieldwork reported here was conducted in the immediate aftermath of the highly-publicized 2019 US EVALI (E-cigarette or Vaping Use-Associated Lung Injury) outbreak in which, as of February 2020, some 2,807 cases and 68 deaths had been reported. The US Centre for Disease Control (CDC) stated that these were largely due to the use of vitamin E acetate as an additive in Tetrahydrocannabinol (THC)-containing e-liquids.[20]

Aside from toxicity, there is also the consideration of harm in a more general sense. Some interviewees cited the early reports of exploding ENDS as evidence of the harm they could cause.

> *"Vape is more dangerous because of the chemicals, and there are cases where they've exploded."*
>
> INDONESIA

> *"My friends say it's dangerous. A friend had a cheap one that exploded. I'm scared by the electricity thing. The taste was good, it tasted like syrup, but I'm scared of the danger."*
>
> INDONESIA

However, by revisiting the data from earlier in this paper suggesting that 57% of Chinese smokers and 63% of Indonesian smokers in our sample believe nicotine to be the most harmful agent of cigarettes, it can be seen that ENDS are guilty by association and so, at least amongst this proportion of smokers, the utility of nicotine-containing ENDS as a smoking cessation aid must be questionable.

Their belief is one shared by the WHO, the organization with perhaps the loudest, most significant, and widest-reaching voice against ENDS.[21] They state: "Evidence reveals that these products are harmful to health and are not safe". As to whether ENDS are more or less dangerous than tobacco, they state: "It is difficult to generalize on the risk to health of ENDS as compared with cigarettes or other tobacco products, as this is contingent on a range of factors. Both tobacco products and ENDS pose risks to health. The safest approach is not to use either".

WHO "Evidence reveals that these products [ENDS] are harmful to health and are not safe... Both tobacco products and ENDS pose risks to health. The safest approach is not to use either"

According to WHO, "To truly help tobacco users quit and to strengthen global tobacco control, governments need to scale up policies and interventions that we know work. Tried and tested interventions, such as brief advice from health professionals, national toll free quit lines and cessation interventions delivered via mobile text messaging is recommended. Where economically feasible, governments should also consider promoting nicotine replacement therapies and non-nicotine pharmacotherapies for cessation". [21]

The findings from a 2021 Cochrane report[2] do not support this assertion. Instead, it presents evidence suggesting that more smokers who use nicotine-containing ENDS achieve smoking abstinence (for six months) than those who use nicotine replacement therapy, nicotine-free ENDS, behavioral support, or who have no support. As recently as June 2021, the UK's National Institute for Clinical Excellence (NICE) and PHE issued draft guidelines to tackle tobacco consumption, stating: "The evidence shows that nicotine-containing e-cigarettes can help people to stop smoking and are similarly effective to other cessation options such as a combination of short- and long-acting nicotine replacement therapy (NRT). The expert committee agreed that people should be able to use e-cigarettes as one of several options to support smoking cessation, if they so choose".

Image: Anti-tobacco messages on advertising for an upcoming APCAT (Asia Pacific Cities Alliance for Tobacco Control) summit in Bogor, Indonesia.

The UK is perceived as a leading authority in THR and smoking cessation, having seen a decrease in smoking prevalence following a range of controls and, more recently, measured ENDS messaging, such as that by NICE, and jointly by the RCGP and Cancer Research UK: [Reproduced in part] "Based on the evidence to date, vaping is a lot less harmful alternative to smoking tobacco... Evidence suggests that e-cigarettes are more effective for smoking cessation compared to both over-the-counter nicotine replacement therapy, and quitting unaided.... Users need to stop smoking and switch completely to e-cigarettes to get the reduced exposure to key toxicants from cigarettes".[22]

RCGP and Cancer Research UK: "Based on the evidence to date, vaping is a lot less harmful alternative to smoking tobacco... Users need to stop smoking and switch completely to e-cigarettes to get the reduced exposure to key toxicants from cigarettes"

In LMIC markets, there is a lower barrier to ENDS adoption, with accompanying evidence of this, for those who can draw the distinction between the safety profiles of tobacco and nicotine. Whilst some see ENDS as reduced harm but not necessarily for entirely the right reasons.

"Traditional cigarettes would be more harmful than directly inhaling nicotine."

CHINA

"E-cigarettes are without nicotine so they're not harmful."

CHINA

Q **Should the premise of reduced harm be enough to promote ENDS as a cessation approach? Is there sufficient evidence of the harm profile of ENDS to make a decision either way?**

STEP 6

Access ends

As they continue through the ENDS adoption journey, a smoker's next step is to gain access to ENDS. This can be usefully broken down into two considerations: availability and affordability.

ENDS availability

In the LMIC markets studied here, the availability of ENDS varied between the countries and within them, and the picture is changing rapidly. As seen in Step 4, both India and China issued sales bans of ENDS products which came into play during the course of the fieldwork behind this paper. In India's case, there was a total ban in September 2019 (on production, importation and sales), whilst in China, online sales were outlawed in November of the same year.

In Guangzhou, a modern Chinese city of 18 million people, ENDS retailers are few and far between, and they were not obviously sold outside of specialist ENDS stores. One of the ENDS retail locations visited by the CDP China fieldwork team was a private residence in an apartment block (Figure 4). It was not positioned for passing trade.

In Guangzhou, a modern Chinese city of 18 million people, ENDS retailers are few and far between

Figure 4: An ENDS retail location in a private residence block in Guangzhou, China (visited by the CDP research team) **(right)**.

The lack of availability of ENDS was cited explicitly as one reason for non-use. Some of those in qualitative research who had used ENDS in the past or who currently did so reported that they relied on friends to source the products from abroad. There was little evidence of ENDS stores in Qingyuan and, indeed, one Qingyuan-based research participant said that he would purchase his e-liquid refills when he travelled into Guangzhou, some 75km away.

The situation presented in India during fieldwork was also of little evidence of ENDS retail outside of a small number of specialist stores. Delhi had few stores, however, perhaps as a reflection of the (then) imminent ban on sales, some appeared permanently closed. There were no stores in the more rural Samalkha. It is assumed that the situation has now changed from little evidence or, more pertinently, little availability to no availability aside from through black-market or online channels.

A surprising number of ENDS stores were found across Jakarta, Bogor and the surrounding towns (Figure 5). An ENDS user in the more outlying villages visited by the CDP team, however, had to travel some distance on their moped down a tortuous mountainside road to reach their nearest store. This was in stark comparison to the near-ubiquity of cigarettes (which were seemingly available and advertised at every kiosk in every village).

Figure 5: ENDS stores in Jakarta, Indonesia **(top and bottom right:)**. A range of products in a ENDS store in Bogor, Indonesia **(bottom left)**.

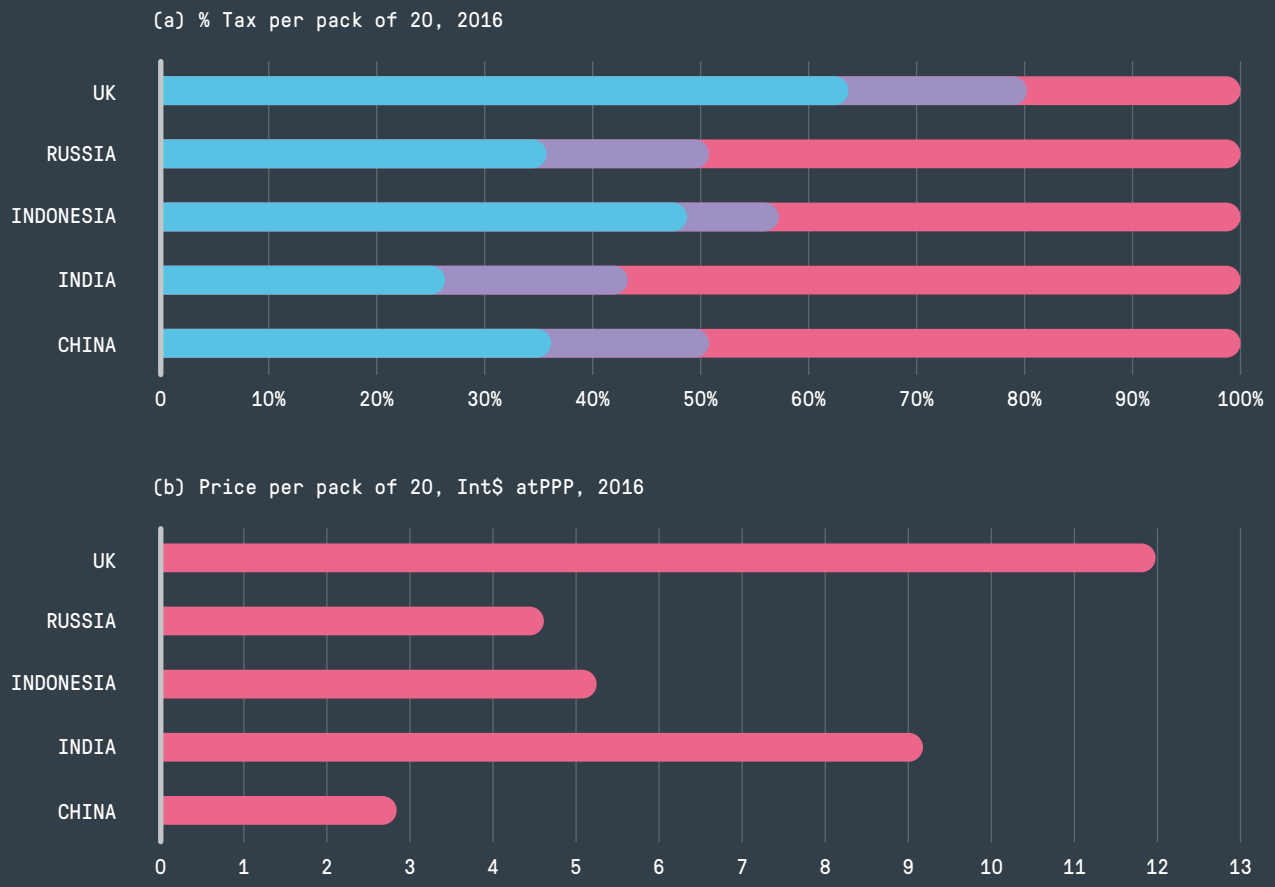


Figure 6: Cigarette taxation percentage **(a)** and price **(b)** compared across markets. Note that prices are presented on a purchasing power parity basis. Source: WHO

Tax: Proportional that is excise; Int$ at PPP

Tax: Proportional that is VAT; Int$ at PPP

Price minus tax; Int$ at PPP

	GDP PER CAPITA, INT$ AT PPP	MODIFIED GDP PER CAPITA*	PRICE OF PACK A DAY FOR 1 YEAR	PROPORTION OF INCOME (PRE-TAX)
UK	42977	27505	4373	16%
RUSSIA	24072	15406	1679	11%
INDONESIA	11605	7427	1909	26%
INDIA	6635	4246	3347	79%
CHINA	15513	9928	1037	10%

Figure 7: Affordability of cigarettes. *Factored by CDP to loosely approximate median income (rather than average) using GINI coefficient of 35.

ENDS affordability

When considering the impediments to the adoption of ENDS, it is important to also consider the current smoking context and assess the competitive landscape (product to product) in LMICs against cigarettes. It is impossible to discuss the affordability of cigarettes and ENDS without considering the effects of taxation.

Tax is an important tool available to governments and policymakers in the effort to curb the use of combustible tobacco. Currently, however, taxes are still relatively low in LMICs when compared to the UK. For the LMICs investigated in this study, the average (2016) total tax applied to a pack of 20 cigarettes was 51% of the final price, compared to 81% for the UK (Figure 6a).

It is unlikely that many consumers know (or even care) about current tax percentages; rather, they are interested in total cost. Using a purchasing power parity (PPP) basis (to enable a fairer comparison across the countries), the price in the UK is over double that of Russia, Indonesia and China, whilst India is closer to three-quarters that of the UK (Figure 6b).

To get even closer to real and relative affordability, we looked at cigarette prices in the context of median income levels for each market; this is captured in Figure 7.

An estimate for median income was sought as the majority of LMICs around the world have high levels of inequality and, as a result, the average income value is considerably higher than the income level of the majority of the population. As a result, the median income is significantly lower in these countries. Given that there is evidence showing that smoking rates are disproportionately higher amongst the lower-income and less-educated brackets of societies, this is an important distinction to make.

It is striking to see how much more unaffordable cigarettes are in India compared to the other LMICs (and the UK), which potentially goes some way to explaining India's higher prevalence of the much less expensive bidis, smokeless tobacco products, and single cigarette purchases. Selvaraj et al.[23] highlight that bidi and cigarette prices are largely inelastic in India but with the highest elasticity values amongst the poorest groups, indicating that poorer consumers are more price responsive.

When considering the price point differential between a pack of cigarettes and an ENDS, it quickly becomes apparent that price currently represents a significant barrier to many potential consumers in LMICs. The cost of an electronic device can be a 'cost-magnitude' greater than that of a pack of cigarettes, and (notwithstanding local ENDS bans) where individual cigarettes are available, the real-life relative affordability decreases further.

The high up-front costs of ENDS pose a real financial barrier and a perceived barrier to consumers (given that, on the store shelves, the one-off device cost will undoubtedly be compared directly to the cost of the next pack of cigarettes). For some (many in LMICs) – the real barrier may be insurmountable (without external financial support) whilst, for others, e-liquid has to be sufficiently discounted relative to the equivalent number of cigarettes to allow amortization of ENDS device cost. Given the low production cost of cigarettes, taxation will clearly have a role to play in setting cigarette and e-liquid price ratios.

> *"It's [e-cigarette] expensive and smelly, difficult to clean and needs charging."*
>
> CHINA

The next challenge becomes how to articulate the role of amortization to smokers. One ENDS manufacturer in Indonesia has clearly recognized this and has sought to explicitly highlight the long-term cost-saving of their product over cigarettes (Figure 8).

Q Can ENDS ever be a viable alternative to the poorest of smokers?

Figure 8: ENDS packaging in Indonesia describing the potential cost-saving to be had by switching from cigarettes to ENDS **(Left)**.

MILESTONE

Trial ENDS

At this point, smokers have recognized the risk of smoking, are motivated to stop smoking on the basis of harm, have an awareness of ENDS and recognize or accept them as representing reduced risk and, finally, have been able to acquire a product to try. They have now reached the milestone of trialing ENDS and we must make the assumption that an ENDS product is used at least once. The journey does not end here, however, and for ENDS to have utility as a cigarette substitute, then continued adoption, critically in place of combustible tobacco products rather than alongside, must happen. This brings us to the final step of the journey.

Image: Man using an ENDS device in Jakarta, Indonesia.

STEP 7

Maintain ends adoption and avoid smoking relapse

In order for smokers to continue to use ENDS and ultimately replace combustible tobacco products, then they must match or exceed the satisfaction that smokers achieve from combustible tobacco products or confer another benefit, such as reduced cost, or reduced lingering odor, that offsets any decrease. Importantly, this satisfaction is defined by a unique set of metrics for each smoker.

Smoking 'jobs to be done'

Any customer uses a product because it enables them to get a 'job' or series of jobs done. They choose from a range of products that best enable them to get the jobs done. Smokers are no different; they choose to smoke to achieve something, to attain goals. These goals or jobs are functional, emotional and social in nature. Examples of functional jobs that smoking helps achieve are: "wake myself up", "kickstart my day", "boost my energy levels", "think clearly", "aid digestion", and "neutralize a nasty taste".

Any customer uses a product because it enables them to get a job or series of jobs done. They choose from a range of products that best enable them to get the jobs done. Smokers are no different, they choose to smoke to achieve something, to attain a goal.

"My smoking trigger is definitely a stressful day at work. I think I could quit if you told me stress wouldn't happen."

RUSSIA

"My job made me smoke again. It was boring... the hours were long. At the beginning I took snacks to kill time but they didn't work so I started smoking again."

CHINA

A nuance in the case of smoking, however, is the addictive nature of nicotine. Smoking (nicotine) is being used by smokers to correct states such as lethargy, irritability, and lack of concentration that an absence of it has created. Some functional jobs, though not all, are fulfilled through the mechanism of nicotine replenishment. The amount of nicotine and the rate and frequency of its delivery required to reverse the absence is unique to each smoker.

Emotional jobs describe those feelings that people want to have or want to avoid having, or they are emotionally driven states. They include: "have a moment to myself", "reward myself", "feel in control", "stop feeling lonely", and "boost my self-confidence". Whilst social jobs center on a smoker's interactions with others and how they wish to and wish not to be perceived. Examples are: "give me confidence to start a conversation", "feel confident in a social situation", "feel part of a social group", "be perceived as feminine/masculine/successful...", "avoid being perceived as a bad mother/father by my children", etc.

> *"I feel I can't survive without a cigarette. It's a very intimate friend that I must keep in touch with every day. I have the experience of getting drunk in smoking."*
>
> CHINA

We can expect that these jobs which deal with inherent and internal human needs are less influenced by external factors than perhaps some of the driving forces described within previous steps. There are still some factors, however, and particularly those which have a social basis, which can drive a market correlation. We have seen earlier how gifting cigarettes is an important part of Chinese culture. They are used to "cement a business relationship", for instance. This happens both via gifting, which does not necessarily translate to smoking, of course, but also offering a cigarette from an open packet, which almost certainly does.

Within Indonesia, China, India and Russia, the disparity in smoking prevalence between the genders is much more marked (particularly in Indonesia) than in the UK. In Indonesia, smoking is almost a rite of passage for boys and young men. It plays a big role in fulfilling social jobs.

> *"My friends after we finished school, we'd hang out. If you're a man you're supposed to smoke... Come on you chicken [they'd say]."*
>
> INDONESIA

As we saw in Step 3, our fieldwork suggested that Indonesian women, on the other hand, are more reluctant to smoke in public. For them, social jobs to be fulfilled by smoking are more likely to be in the context of a smaller social group of other female smokers.

In the UK, there is less difference in the societal perception of female and male smokers, and we see smoking rates for the two genders that more closely track each other.

The smoking sensorial experience

Whereas smokers smoke to do a job, the act of smoking generates sensorial and habitual associations which act to reinforce consumption and help to define satisfaction.

The act of smoking generates sensorial and habitual associations which act to reinforce consumption and help to define satisfaction

Cigarette smoking delivers a deeply multi-sensorial experience. We can take the addictive physiochemical effects of nicotine – the "hit" or "head rush" – and the whole-body sensations of inhaling and exhaling as a given, however, the experience encompasses a wider range of sensory cues that also draw the smoker in via their own forms of addiction. Two of the strongest attributes are the taste of tobacco and smoke, which plays a part via the warmth, heaviness of the feeling and amount of smoke in the mouth, the amount of smoke when exhaling, the feeling of smoke in the lungs and then its smell in the air, on fingers, on breath, on clothing, and on hair. Whilst to the non-smoker, the smell of tobacco smoke may be unpleasant, to some smokers, it represents a more positive feeling and can be a desired part of the smoking experience.

CDP's quantitative survey data places tobacco flavor, heaviness and amount of smoke in the mouth, and amount of smoke when exhaling as high-ranking attributes across all four tested LMIC markets, though there are some market nuances. China, for instance, can be characterized as a 'traditional' smoking market. Tobacco is important from a flavor and aftertaste perspective, whilst 'artificial' flavors are less desired.

Image: Man smoking a cigarette in Panipat, India.

An e-cigarette shop owner in Guangzhou reported that tobacco was the most popular e-liquid flavor that he sold. This can be contrasted with the role that flavored e-liquids have played in the adoption of ENDS in leading markets. A 2018 study of over 20,000 adult ENDS users in the US found that frequent users who had completely switched from smoking cigarettes to using ENDS were increasingly likely to have initiated ENDS use with non-tobacco flavors and to have transitioned from tobacco to non-tobacco flavors over time.[24]

"Sweetness" was a commonly used sensory descriptor in Indonesia, more so than in other markets and likely due to the natural sweetness of the cloves within kreteks (and the associated practice from the tobacco companies of dipping the filters in saccharin to strengthen this association on the lips).[25]

> *"I prefer [kreteks] with a filter because you can still taste the sweetness in the filter."*
>
> INDONESIA

There is no one-size-fits-all smoking experience. The ideal sensory experience of cigarettes, the degree to which a person can discern it and, indeed, the degree to which they can articulate it is very specific to the individual.

There is a no one-size-fits all smoking experience. The ideal sensory experience of cigarettes, the degree to which a person can discern it and, indeed, the degree to which they can articulate it is very specific to the individual

Some smokers are particularly adept at defining their own personal desired experience along sensorial dimensions. One of the main axes for discussing and describing cigarettes was that of strong versus light. Due to the physical construction of cigarettes, this specific axis contains a number of sensorial aspects and characteristics that different people may refer to using differing descriptors.

On the 'strong' end of this axis were also associations with 'heaviness', size, intensity, duration of use, smell, and amount of smoke. Physically, this 'strength' came from a tobacco product that was more densely packed with tobacco, often wider in diameter, and potentially rolled without a filter. The higher density of tobacco slowed the combustion rate, increased the required draw resistance to puff and increased the volume/amount of smoke generated.

Conversely, on the 'light' end of this axis, there were associations with thinner cigarettes, with more loosely packed tobacco providing a much lower draw resistance to puff and, as a result, combusted and consumed much faster. They would generate less smoke and be more likely to have a filter.

> *"I like Double Happiness. I have tried other brands. It's the taste - it's not strong. I don't like a strong taste of tobacco. It's not very bitter, not dry."*
>
> CHINA

> *"I call it I'm 'drunk' in smoking and the whole body is drifting. It's a psychological sense of inhalation."*
>
> CHINA

Touch as one of our senses shouldn't be forgotten and smokers raised both 'mouth feel' and 'hand feel' as important sensorial attributes. Form and materials both play a part here.

The rituals of smoking

The final element of the pull towards smoking is represented by the habitual behaviors or rituals that smokers acquire over time. It is the winding off of the cellophane wrapper tag, the flipping open of the box, the offering of a single exposed cigarette to a friend, the tapping of the cigarette on the box or table, the flicking of the cigarette lighter and its smell and sound, the lighting of the cigarette, the flicking of ash and finally the deliberate twisted stubbing out on the ground. These are all ingrained and highly associative behaviors that can create a void when not enacted. Whilst they will not necessarily be missed in the absence of smoking, they must be mimicked or replaced if that act of smoking is itself replaced, for example, by ENDS.

> *"Tapping the box is a habit to make sure the tobacco is scattered and it's easier to inhale."*
>
> INDONESIA

Smokers may ultimately find other solutions to helping them achieve their functional, social and emotional jobs (the reasons for smoking). However, because sensorial and ritual dimensions of need are generated by the act, then these metrics of performance are strong determinants of the success of ENDS as combustible product substitutes.

Of those smokers met during fieldwork and who had tried ENDS, there were some clear experience deficits. Unsurprisingly, an insufficient tobacco taste and flavor and no tobacco smell were the most prominent factors. Others included poorer physicochemical response (slower and less intense), poorer throat excitement/hit, a perception of and actual chemical taste associated with e-liquid flavors, no lighting experience. The 'rituals' of ENDS such as charging, re-filling, and cleaning were simply considered by some to be inconveniences.

A device that contains no tobacco and emits no smoke must replicate a tobacco taste and a smoky experience. A device which is activated by pressing a button is competing against the multi-sensory ritual of flicking a cigarette lighter. When the attachment to these experiences is intense, then the barriers to ENDS as replacements to smoking can be high.

> *"The e-cigarettes can help with the nicotine but the difference between e-cigarettes and cigarettes is the feeling to excite my throat. The taste is different."*
>
> CHINA

> *"Vape can't provide the same sensation. When you blow there's no aftertaste; it's gone."*
>
> INDONESIA

To further understanding of how these barriers might be overcome we captured and measured the importance of jobs to be done plus sensorial and smoking rituals in each of the four LMIC markets. We then undertook a jobs-based segmentation to understand what segments of users exist across the markets that have the same needs in terms of jobs, sensorial requirements and habitual associations of smoking. The concept of cross-market segmentation is important. Whilst THR and smoking cessation strategies must, by necessity of local governance, be market-focused, or at least market-nuanced, ENDS must appeal to users whose needs are not necessarily based on their nationality.

“After you hear the click of the lighter you feel instantly excited. Inhaling helps me to recharge my energy. Like the first mouthful of drink when thirsty.”

CHINA

Image: Lighting a cigarette during an interview in Jakarta, Indonesia.

Four segments of smokers, cutting across the four markets (i.e. existing within all of them), were identified and the underlying characteristics which were most likely to be represented in each was captured from the quantitative data.

The cool as cucumbers... almost

Image-conscious smokers who experience occasional vulnerability/ insecurity and reach out to their cigarettes for companionship and a confidence boost. They represent a segment where the barrier to ENDS use is mixed.

The deep-drawing thinkers

They smoke for themselves, not for the acceptance of others. They're addicted, they know they're addicted and they know smoking is harmful to their health. They represent a low impediment level... if nicotine addiction can be addressed.

The rebels without a cause

Socially-influenced smokers who seek acceptance amongst their peers whilst fearing social isolation and awkwardness, using cigarettes as a physical crutch. They are emotionally attached to smoking, cigarettes, the brand and the rituals, and have lower awareness of ENDS and their relative harm. They are more likely to believe their own smoking is not detrimental to their health. They represent the segment facing the highest barriers to ENDS adoption.

The escapists

Socially-conscious 'occasion' smokers who reach to their cigarettes out of association - when needing a break, when drinking alcohol, when eating - but fear disapproval from those around them. With low emotional attachment to their cigarettes and smoking but harboring myths about tobacco and ENDS harm, they are a mixed impediment segment.

THE COOL AS CUCUMBERS… ALMOST

THE DEEP-DRAWING THINKERS

Figure 9: Four segments of smokers, each with a distinct set of needs (functional, emotional, social, sensorial, habitual).

THE REBELS WITHOUT A CAUSE

THE ESCAPISTS

Developers of ENDS must do so with the needs of their users and regulators top of mind. It is key to acknowledge the differing functional, social, emotional, sensorial and ritual needs of users. A one-size-fits-all approach, whether within a market or across markets, will not be successful. Whilst regulators must, by necessity, approach their world in market-based silos, ENDS innovators may be wise not to pursue that approach.

The barriers to innovation can themselves be high, however. The fluid nature of the ENDS regulatory landscape brings with it the risk of investing in developing new products. It is possible that only a small number of large companies – that is, existing tobacco companies and state monopolies – will have what it takes. A consequence, of course, is that motives will be questioned and ENDS, as a reduced risk option to tobacco consumption, will remain a hard sell to consumers, whilst tougher regulations will likely continue to be enforced.

This brings us to our final question...

Q **Are regulators right to clamp down on ENDS or does this serve to stifle the innovation that could lead to safer, market acceptable ENDS and ultimately THR?**

Summary

In this paper, we make no judgement on whether or not ENDS are either a safe or effective means for reducing the use of combustible tobacco products. Rather, we question, if they are and can be proven to be so in the long-term, what barriers exist to their adoption in LMIC countries where 80% of the world's smokers reside?

The finding is that the barriers are numerous and high and, at each step of their ENDS adoption journey, smokers are faced with impediments (Figure 10). Some, such as cognitive dissonance, are rooted internally as a smoker's own justification for smoking outweighs their acknowledgement of its harm. Other impediments are centered on the social and societal context evidence by strong cultural forces acting to normalize smoking, whilst low in-market availability and strict regulatory frameworks are making ENDS simply inaccessible to some.

In India, without a strategic, in-part reversal of the total ban on ENDS marketing and sales - allowing, for instance, medically licensed and regulated ENDS products - the barriers for anything other than minimal adoption may seem insurmountable.

In other markets, there is still much to be achieved through improved tobacco harm communication, but it must be acknowledged that neither communication nor information necessarily relate to education and, most

Figure 10: The relative height of the barriers at each step along the ENDS Adoption Journey in the markets considered here. Impediment level; **low:** ● **medium:** ● **high:** ●

importantly, action. Perhaps before the truths of cigarette and tobacco harm can be learned and understood, the mistruths must be dispelled - a difficult task when those healthcare professionals at the forefront of delivering tobacco cessation services are sometimes themselves unsure of or confused about the roots of tobacco harm. Of course, it is not only ENDS that potentially suffer in the misunderstanding of tobacco harm.

Any medically licensed nicotine replacement products such as patches, gums and oral sprays face the same dilemma as ENDS when trying to penetrate into markets where nicotine is considered the major villain of smoking. This is despite the fact that NRTs are manufactured by the pharmaceutical industry, positioned and available in pharmaceutical settings.

The holistic experience that cigarettes deliver is finely tuned to the individual. In combustible tobacco, ENDS have formidable competition for smokers' attention. It is a category having a huge number of variants that appeal to a range of smoker sensorial needs. ENDS can, in theory, compete very well on metrics such as flavor, taste, nicotine delivery rate, and form factor.

Meanwhile, smokers have an emotional allegiance to cigarettes, and the attachment to the physical ritual surrounding their consumption is high. Elements represented in this space may be harder for ENDS to replicate.

Are these barriers surmountable? Should they be made insurmountable? We will leave that debate for another day. However, hopefully, this paper raises some questions which will get us that little bit closer to knowing and closer to the end goal of tobacco harm reduction.

Q **How can we enable smokers to better internalize personal smoking risk?**

Q **How can we better educate smokers and their influencers on the risks and causes of tobacco harm rather than just inform them?**

Q **Can ENDS ever combat the apparently often overwhelming forces that keep smokers smoking?**

Q **Does the harmonization of combustible tobacco and ENDS regulation serve to help or hinder global THR initiatives?**

Q **Should the premise of reduced harm be enough to promote ENDS as a cessation approach? Is there sufficient evidence of the harm profile of ENDS to make a decision either way?**

Q **Can ENDS ever be a viable alternative to the poorest of smokers?**

Q **Are regulators right to clamp down on ENDS or does this serve to stifle the innovation that could lead to safer, market acceptable ENDS and ultimately THR?**

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Nicki Sutton, speaking with the locals in Bogor, Indonesia.

Ben Kelsey, interviewing a respondent in their Moscow home.

George Bostock, filming in Jakarta, Indonesia.

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