


Early adoption of heated tobacco products resembles that of e-cigarettes

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ABSTRACT

Background Heated tobacco products (HTP) generate nicotine-containing aerosol by heating tobacco rather than burning it. The US Food and Drug Administration (FDA) has recently authorised the sale of one HTP brand, iQOS, in the USA. This study examined the awareness, use and risk perceptions of HTP in the USA following FDA authorisation.

Methods A national probability sample of 20 449 US adults completed an online survey between November 2019 and February 2020. In addition to assessing awareness and use of HTP, two ratios were calculated: the ratio of those who experimented with HTP given that they had heard about it (E/H) and the ratio of those who currently used HTP given experimentation (C/E). These ratios for HTP were compared against those for e-cigarettes from a similar national survey in 2012.

Results Overall, 8.1% of respondents had heard of HTP. Only 0.55% had tried and 0.10% were current users. The rate of experimentation among those who heard about HTP and the rate of current use among experimenters were, however, similar to those for e-cigarettes in 2012: E/H and C/E for HTP were 6.8% and 18.2%, respectively; and 10.7% and 17.8%, respectively for e-cigarettes. The majority of respondents considered HTP either less harmful than (11.6%), or equally harmful as e-cigarettes (42.7%).

Conclusions Only a small fraction of US population in 2020 have tried any HTP. However, the similarity in early adoption rates following awareness, suggests that future adoption for HTP may be similar to that for e-cigarettes, if HTP are marketed more aggressively.

INTRODUCTION

Heated tobacco products (HTP) generate a nicotine-containing aerosol by heating tobacco instead of burning it. As in cigarette smoke and e-cigarette aerosol, nicotine in HTP aerosol is an addictive substance that makes users want to repeat the behaviour.¹ By heating tobacco instead of burning it, HTPs could substantially reduce the amount of harmful substances that come with burning tobacco, according to research by the tobacco industry.^{2–5} Similar argument for harm reduction has been made for e-cigarettes, whose aerosol is generated by heating a liquid, often containing nicotine.⁶ Due to the limited data about HTP that is not from the tobacco industry and the short history of the products, the public health community, has yet to reach any conclusion as to how much harm reduction, if any, can be achieved at a population level with the introduction of HTP into the market.^{7 8}

The HTP market is currently dominated by three tobacco companies: (1) Philip Morris International (PMI), Japan Tobacco International (JTI) and British American Tobacco (BAT).^{9 10} The leading brand, iQOS by PMI, is currently sold in over 40 countries.^{11–17} iQOS was launched in the US by PMI in October 2019, after it received its premarket tobacco application (PMTA) authorisation from the US Food and Drug Administration (FDA).¹⁸ BAT's product Glo is currently under review with the FDA.¹⁹ Ploom Tech, an HTP by JTI, has also been available in the US market as Logic Vapeleaf since June 2018, even though it has not gone through PMTA authorisation process.^{20 21}

US distribution of iQOS is currently restricted to two municipalities: Atlanta, Georgia and Richmond, Virginia.^{22 23} With a soft launch restricted to these states, iQOS devices can only be found at a handful of flagship stores and pop-up shops in the Atlanta and Richmond areas.²⁴ However, HeatSticks ('Heets'), which are the tobacco sticks that are heated in iQOS devices, can be purchased from various tobacco retailers.^{22 23} Furthermore, US residents can still find iQOS via online outlets, although listings by resellers on eBay and Amazon appeared to have been taken down following FDA authorisation.

Before any HTP were locally distributed in the USA, some people had already heard about them and a few had experimented with them.^{25 26} According to two studies that were based on probability samples of the US population, 5%–12% of US adults were aware of HTP in 2017, and 0.7%–2% had tried them.^{27 28} These figures could change given that the FDA has now authorised iQOS for sale in the USA.²⁹

The present study examined the awareness and use of HTP in the USA following the FDA authorisation for iQOS. It also compared the data in awareness and use of HTP with those of e-cigarettes, when the latter gained the interest of the US public in the early 2010s. Of particular interest is how the US public views the risks of HTP compared with e-cigarettes. Since many people consider e-cigarettes to be less harmful than conventional cigarettes, an indication of how they view HTP compared with e-cigarettes would be useful from a public health perspective.³⁰

METHODS

Data source

Data for this study came from a 'Marijuana Use and Environment Survey' administered by the University of California, San Diego. Survey participants



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were randomly sampled from the Ipsos' KnowledgePanel, a probability-based online panel designed to be representative of the USA.^{31 32} A subset of the survey questionnaire assessed tobacco use behaviour as well as attitudes towards new products such as e-cigarettes and HTP. A detailed description of the methods used to recruit people into the KnowledgePanel can be found elsewhere.³³ The panel provides an efficient way of accessing a probability sample of the US population, whose representativeness has been compared with other large population surveys in the USA.^{31 32}

A random sample of 37 603 KnowledgePanel members, who were 18 years or older, was invited to complete the survey. A total of 21 903 completed it, with a response rate of 58.2%, slightly lower than an earlier study of a similar survey.³⁴ The subset that answered all questions on tobacco use and provided demographic information were 20 449 participants, which is the effective sample for the current analysis. The survey was conducted between November 2019 and February 2020, with a majority (97%) of them participating in January 2020.

Measures

Awareness of HTP was assessed as follows: All survey participants were shown an image of iQOS as an example of an HTP, with an accompanying description: 'Heat-not-burn tobacco products: heat sticks (heat-sticks) or capsules to produce a vapour. They may also be called HTPs. They are different from e-cigarettes. Popular brands include iQOS, Glo and Ploom Tech.' Then, they were asked, 'Before today, have you heard of heat-not-burn tobacco products?' For those who answered yes, they were asked, 'Where did you LAST hear about heat-not-burn tobacco products?' Response options were: 'Internet or Social Media (eg, Facebook, Instagram, YouTube)'; 'TV or streaming service (eg, Netflix, Hulu, Amazon Prime)'; 'Radio or music streaming service (eg, Spotify, Pandora, SoundCloud)'; 'A friend or someone else'; 'Magazine'; 'Gas station or convenience store'; 'Smoke or vape shop'; 'Bus stop or billboard'; 'Other.' Survey respondents could only select one option.

For those who had heard about HTP, they were asked if they had ever used an HTP (ever users). If they had, then they were

asked if they have used it in the past 30 days (current users). All participants were also asked if they had ever smoked cigarettes or ever used electronic cigarettes.

To assess risk perceptions, those who had heard about HTP were asked: 'Compared with e-cigarettes, do you think heat-not-burn products are...?' Response options were: 'Less harmful'; 'Equally as harmful'; 'More harmful'; and 'I don't know.'

Analysis

All percentages were weighted by population parameters based on the most recent US Current Population Survey. A survey-specific poststratification adjustment was used to account for any survey non-response, as well as any non-coverage or undersampling and oversampling resulting from the survey-specific sampling design. SEs and 95% CIs were computed based on the sampling distribution of the corresponding summary statistic.³⁵ We also calculated two ratios: the ratio of those who experimented with HTP given that they had heard about it (E/H) and the ratio of those who currently used HTP given experimentation (C/E). We compare these two ratios for HTP to those for e-cigarettes in the 2010s.³⁴ The e-cigarette data used for comparison here were obtained from a survey of KnowledgePanel, conducted between February 24 and 8 March 2012.³⁴ All calculations were done using SAS V.9.4.³⁶

RESULTS

Table 1 presents the results on awareness of HTP by demographics and tobacco use status. Overall, 8.1% of respondents had heard of HTP. Twice as many males reported hearing about HTP as females (10.9% vs 5.5%, respectively). The awareness was largely similar across ages except for seniors (65+), where a lower percentage reported hearing about the product. Across ethnicities, similar awareness was observed except for African Americans, who had a lower rate of awareness (5.8%). HTP awareness was also significantly higher for college graduates than those without a college degree (10.0% vs 7.2%, respectively).

Awareness of HTP differed by smoking status. Significantly more ever smokers reported hearing about HTP than never

Table 1 Prevalence of having ever heard of heated tobacco products by demographics and cigarette and e-cigarette use status

	Total N=20 449		Never smoker N=9248		Ever smoker N=11 173		Never used e-cig N=17 257		Ever used e-cig N=3157	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Overall	8.1	7.6 to 8.6	7.1	6.4 to 7.8	9.0	8.3 to 9.7	7.4	6.9 to 7.9	11.1	9.7 to 12.5
Gender										
Male	10.9	10.2 to 11.7	9.3	8.2 to 10.3	12.3	11.2 to 13.4	10.2	9.4 to 11.0	14.3	12.2 to 16.4
Female	5.5	4.9 to 6.0	5.3	4.5 to 6.1	5.6	4.8 to 6.4	4.9	4.3 to 5.5	8.0	6.2 to 9.7
Age										
18–24	8.2	6.1 to 10.3	7.4	5.2 to 9.6	10.6	5.7 to 15.6	7.1	4.9 to 9.4	10.9	6.3 to 15.5
25–44	9.4	8.4 to 10.3	7.8	6.6 to 9.0	11.0	9.6 to 12.5	8.4	7.4 to 9.4	12.1	10.1 to 14.2
45–64	8.4	7.6 to 9.1	7.5	6.4 to 8.6	9.0	8.0 to 10.0	8.0	7.3 to 8.8	10.1	8.1 to 12.1
65+	5.3	4.6 to 5.9	4.6	3.7 to 5.4	5.7	4.9 to 6.6	5.1	4.5 to 5.7	7.7	4.3 to 11.0
Ethnicity										
NH-White	8.0	7.5 to 8.6	7.2	6.4 to 8.0	8.7	7.9 to 9.4	7.3	6.8 to 7.9	11.0	9.4 to 12.6
NH-AA	5.8	4.6 to 7.0	3.8	2.4 to 5.1	8.1	6.0 to 10.1	4.8	3.7 to 5.9	10.5	5.9 to 15.0
Hispanic	9.4	8.0 to 10.9	8.8	7.0 to 10.5	10.4	8.1 to 12.8	8.8	7.3 to 10.4	12.5	8.6 to 16.3
NH-Other	9.1	6.9 to 11.3	7.4	4.8 to 10.0	11.5	7.8 to 15.2	8.8	6.4 to 11.3	10.3	5.7 to 14.9
Education										
No BA/BS	7.2	6.6 to 7.8	6.4	5.5 to 7.3	8.0	7.1 to 8.8	6.3	5.7 to 6.9	10.7	9.1 to 12.4
BA/BS+	10.0	9.2 to 10.7	8.4	7.4 to 9.4	11.7	10.6 to 12.9	9.6	8.8 to 10.4	12.3	10.0 to 14.6

BA/BS, bachelor degree; NH-AA, non-Hispanic African American; NH-other, non-Hispanic other; NH-white, non-Hispanic white.

Table 2 Reported source of hearing about heated tobacco products

	Total N=1644		Male N=1137		Female N=507	
	%	95% CI	%	95% CI	%	95% CI
1. Internet or social media	20.7	18.2 to 23.3	23.4	20.1 to 26.7	15.7	11.9 to 19.6
2. Television or streaming service	12.3	10.3 to 14.2	11.5	9.4 to 13.6	13.8	9.9 to 17.7
3. Radio or music streaming service	3.1	2.0 to 4.2	2.8	1.7 to 4.0	3.5	1.2 to 5.8
4. Friend or someone else	25.1	22.4 to 27.7	23.3	20.0 to 26.5	28.4	23.7 to 33.1
5. Magazine	3.3	2.3 to 4.3	3.7	2.4 to 5.0	2.6	1.1 to 4.2
6. Gas station or convenience store	8.2	6.6 to 9.8	8.3	6.3 to 10.2	8.1	5.2 to 11.0
7. Smoke or vape shop	7.3	5.6 to 9.1	6.2	4.3 to 8.2	9.4	5.9 to 12.9
8. Bus stop or billboard	1.0	0.4 to 1.5	1.0	0.4 to 1.7	0.9	0.0 to 1.7
9. Other	19.0	16.7 to 21.4	19.8	16.9 to 22.7	17.6	13.5 to 21.7

smokers (9.0% vs 7.1%, respectively). The difference between ever e-cigarette users and never users was larger (11.1% vs 7.4%, respectively) than that observed for smoking status. The differences between ever and never users was generally maintained across all demographics.

Table 2 presents how respondents reported last hearing about HTP. For those who had heard about the product, the most frequently endorsed category was a personal source (a friend or someone else; 25.1%), followed by the 'Internet or social media' (20.7%) and 'TV or streaming service' (12.3%). A small percentage of participants reported hearing about HTP from a 'gas station or convenience store' (8.2%) or from a 'smoke or vape shop' (7.3%). A sizeable percentage, 19.0%, did not endorse any of those categories and instead reported 'other' sources. More male participants reported last hearing about HTP on the 'internet or social media' compared with female participants (23.4% vs 15.7%, respectively); there were no other significant differences between the sexes.

Table 3 presents the prevalence of HTP use. Overall, 0.55% of participants reported having ever used an HTP. Among those who had never smoked or used e-cigarettes, only 0.24% had tried an HTP. Among those who had only smoked cigarettes but never tried e-cigarettes, the rate was similar, 0.25%. Among those who had tried e-cigarettes, regardless if they had tried cigarettes, the rate was significantly higher, 1.90%.

The prevalence of current HTP use was very low, 0.10%. The use rate was noticeably higher for those who had tried e-cigarettes compared with those who had never tried cigarettes or e-cigarettes (0.43% vs 0.05%). The total number of HTP users in the study was, however, small, rendering the difference statistically insignificant.

Figure 1 presents two ratios: first, the ratio of those who experimented with HTP given that they had heard about it (E/H) and the ratio of those who currently used HTP given experimentation (C/E). Figure 1 also presents those ratios for electronic

cigarettes in 2012³⁴ to be compared with the rates for HTP in 2020. For this comparison, we chose a national survey that was conducted in 2012, also using the sample from Knowledge Panel.³⁴

Figure 1 shows that the E/H for HTP is about 6.8% (0.55/8.1=6.8%). For comparison to e-cigarettes, we used published data from a 2012 national survey.³⁴ The 2012 survey found a large proportion, 75.4%, of the US population had heard about e-cigarettes and 8.08% had experimented with them. Thus, the E/H for e-cigarettes was about 10.7% (8.08/75.4=10.7%).³⁴ The C/E for HTP in the current study is 18.2% (0.10/0.55=18.2%). The C/E for e-cigarettes in the cited study was 17.8% (8.08% reported that they had ever used e-cigarettes, and 1.44% reported currently using e-cigarettes, 1.44/8.08=17.8%).

Figure 2 presents the perceived harmfulness of HTP compared with that for e-cigarettes. Overall, the majority of respondents either considered HTP to be less harmful (11.6%) or equally as harmful as e-cigarettes (42.7%). 37.2% felt unsure about the relative risk of these two products and chose the option of 'I don't know'. (Statistically speaking, choosing 'I don't know' is similar to choosing 'equally harmful' when two other response options of 'more harmful' and 'less harmful' are available. Thus, we plotted the 'I don't know' next to 'equally harmful'). Only 8.5% considered HTP to be more harmful than e-cigarettes. Similar patterns existed for both never smokers and ever smokers. Interestingly, never smokers were a little more sure than ever smokers that HTP and e-cigarette products were equally harmful (47.1% vs 39.5%) and less likely to choose 'I don't know' as an answer (32.6% vs 40.6%).

DISCUSSION

Public awareness of HTP and the rate of experimentation with these new products have not increased since iQOS received

Table 3 Prevalence of ever and current use of heated tobacco products

	N	Ever use N=20 397		Current use N=20 396	
		%	95% CI	%	95% CI
Overall		0.55	0.40 to 0.69	0.10	0.03 to 0.17
Never used cigarettes or e-cigarettes	8972	0.24	0.09 to 0.38	0.05	0.00 to 0.11
Ever smoked cigarettes but never used e-cigarettes	8274	0.25	0.11 to 0.38	0.00	
Ever used e-cigarettes (including ever smoked cigarettes)*	3151	1.90	1.24 to 2.56	0.43	0.07 to 0.79

*The overwhelming majority (92%) of those who had tried e-cigarettes had also smoked cigarettes. Thus, those who only tried e-cigarettes without ever smoking cigarettes (the 8%) were combined with those who tried both cigarettes and e-cigarettes in the analysis. They form one category in the table 'ever used e-cigarettes'.

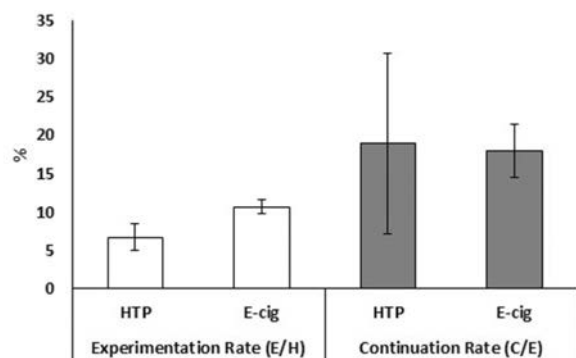


Figure 1 Adoption rates for heated tobacco products (HTP) and e-cigarettes. E/H=the ratio of those who experimented with a product (HTP or e-cigarettes) given that they have heard about it. C/E=the ratio of those who continued to current use (HTP or e-cigarettes) given experimentation. The ratios for e-cigarettes were calculated from a nationally representative study of e-cigarettes in 2012 using a KnowledgePanel sample.

PMTA authorisation from the FDA in April 2019 and launched test markets in two US cities. As of early 2020, about 8% of the US population had heard of HTP and about 0.6% had used them. These were no higher than what was found in 2017, when 5%–12% of US adults were aware of HTP and 0.7%–2% had tried them.^{27 28}

This low awareness contrasts with a very high awareness of e-cigarettes in the early 2010s, when e-cigarettes started to gain the attention of the American population. In 2012, for example, about three-quarters of the US population had heard about e-cigarettes, a level of awareness that is high for any new product that will eventually be used by only a minority of the population.³⁴ That HTP are still relatively unknown in 2020 when compared with awareness of e-cigarettes in early 2010s mainly reflect the fact that not much discussion of HTP has appeared in the media and there is little company-sponsored advertising. In 2012, for example, most people who were aware of e-cigarettes had heard about them through the television, even though direct consumer advertising was limited at the time.³⁴ E-cigarettes were being widely discussed in news reports, often with much controversy.³⁴ By contrast, the people who have heard about HTP products in 2020 have mainly heard about them through social networks (eg, friends, social media). Currently, there is very limited direct consumer advertising and little discussion of HTP in the news, although this could change with greater availability of the product. It is important to note that differences in the availability of products may affect awareness. For example, at the time of this study, HTP products had only been available

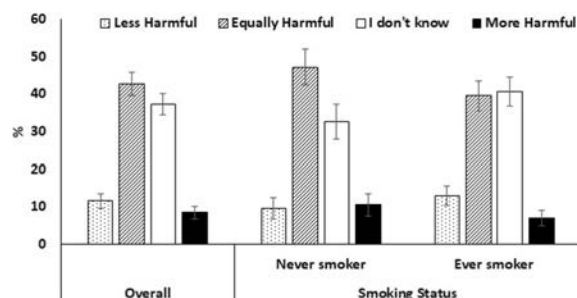


Figure 2 Perceived harm of heated tobacco products, compared with that of e-cigarettes.

for a few months in a few test markets. In contrast, e-cigarettes were available for a longer period of time before the panel data were collected in 2012, providing more time for a greater level of awareness.

Nevertheless, there are important similarities in the early adoption pattern of HTP to that of e-cigarettes. The two ratios shown in figure 1 are good indicators of future adoption of the product: among those who had heard about HTP, about 7% tried an HTP (E/H), while 18% who tried an HTP became current users (C/E). While the former (E/H) was somewhat higher for e-cigarettes in 2012 than for HTP in 2020 (11% vs 7%), the latter (C/E) was the same for e-cigarettes and HTP, 18% for both.³⁴ In other words, once someone has some experience with these products, the probability of becoming a continued user is the same, about one in five for either product. Thus, it is conceivable that the number of experimenters will dramatically increase if more people learn about HTP, either through industry promotion or some other means. Furthermore, these data suggest that a predictable percentage of those who had experimented with HTP would become continual users.¹⁷

The similarity in the adoption rates for e-cigarettes and HTP may reflect shared underlying factors. Years of an antismoking campaign in the USA have led people to look for tobacco products that are less harmful than cigarettes.^{37 38} Even though e-cigarette have never been authorised by the FDA as less harmful, data indicate most people believed that e-cigarettes were less harmful than conventional cigarettes.^{39–46} Since then, reports of lung injury and an increased risk of COVID-19 infection have altered people's perceptions of the harmfulness of e-cigarettes, which may have impacted their perceptions of the relative harmfulness of HTP when compared with e-cigarettes.

In the same way, HTP was not approved as less harmful than cigarettes but a significant percentage of the public believed they were less harmful than or equally as harmful as e-cigarettes, as shown in figure 2 (note that iQOS did not receive MRTP authorisation from FDA until 7 July 2020).⁴⁷ In fact, this study shows that the people most interested in HTP products were those who had already tried e-cigarettes. The vast majority of ever e-cigarette users were ever cigarette smokers (92% in the present study).⁴⁸ Thus, the fact that the smokers who have tried e-cigarettes are most likely to experiment with HTP suggests there is a common interest in harm-reduction products among these experimenters. By contrast, those smokers who have not tried e-cigarettes were much less interested in experimenting with HTP. Given that many adults who have tried e-cigarettes are smokers who are interested in either using e-cigarettes to reduce their consumption of cigarettes or to quit smoking entirely,^{42 49 50} it is possible that they believe HTP will serve a similar function as e-cigarettes.

The response on the relative risk of HTP and e-cigarette products in this study further confirms that people generally consider HTP as something no more harmful than e-cigarettes. As shown in figure 2, 54% either considered HTP less harmful or equally harmful as e-cigarettes. Another 37% chose 'I don't know,' with only 9% viewing HTP as more harmful than e-cigarettes. In other words, the public generally consider HTP and e-cigarettes in the same category as far as their health risk is concerned.

HTP distribution in the USA is currently restricted to iQOS, although other brands were also sold without authorisation. Following PMTA authorisation in April 2019, PMI began limited test marketing in Atlanta (October 2019) and Richmond (November 2019).²⁹ Since iQOS is a tobacco product, media advertising or promotion is restricted, constraining marketing mostly to in-store promotion.²⁹ This lack of visibility

and availability of HTP have contributed to the relatively low population awareness. Nonetheless, the tobacco industry is well entrenched across the retail space (convenience stores, food, drug and other mass retail channels), with over US\$73 billion in annual sales just for cigarettes in 2019.⁵¹ Once a national rollout is envisaged, the sale of iQOS can be expected to scale nationally quickly, since the channels of distribution are already in place.

A natural question is why the company that owns iQOS has not promoted it more aggressively after having invested so much in developing the product and then securing the FDA approval. It is beyond the scope of this paper to discuss possible reasons, but suffice it to say that iQOS faces competition from another popular non-combustible product—namely e-cigarettes—a key difference not encountered by iQOS when it launched in Japan. It is possible that PMI/Altria may take a different approach to promote iQOS in the USA from that in Japan. The main advantage for iQOS over e-cigarettes is that the former has received both PMTA and Modified Risk Tobacco Product (MRTP) authorisation from FDA.^{29 47} However, no e-cigarette product has received PMTA or MRTP authorisation. In fact, a critical requirement for continuing ENDS distribution in the USA is that manufacturers have to file a PMTA with the FDA by 9 September 2020.⁵² Companies that file the application will be allowed to continue ENDS distribution for up to a year while the FDA conducts its review.⁵³ Those companies that do not file the application will have to remove their products before the September deadline.^{54 55} While the FDA might delay its action for various reasons, for retailers keen to avoid being caught in the crosshairs of FDA enforcement, PMTA could force a reordering of the playing field for ENDS. It could work in iQOS' favour since the requirement to file a PMTA application represents a significant barrier to entry that could force the exit of lesser e-cigarette players, potentially clearing the field for HTP.⁵⁶ Thus, PMI's decision to gradually roll out iQOS could be seen as simply waiting for less competition. FDA's recent designation of iQOS as an MRTP,⁴⁷ an imprimatur not held by any e-cigarette, could further shift the interest from e-cigarettes to HTP. Surveillance is needed to monitor the marketing practices and the public perception of HTP.

This study is limited in that it only asked survey respondents if they have heard about HTP without further inquiry of what could influence HTP use, especially given widespread marketing of HTP in other countries and on social media. Within a globalised internet economy, access to 'unrestricted' iQOS marketing is only one mouse click (or URL) away. The question about awareness also only asked about the last place they heard about HTP, and respondents may have heard about the product from multiple sources. The limited number of HTP users in the survey also renders infeasible to make regional comparison, which could otherwise have been revealing. The study is also limited in the use of an adult study population. Youth who are not currently using any tobacco product should be a key target group for future research given how attractive iQOS is and its underlying similarity to e-cigarettes.^{23 57} There are also limitations comparing the adoption rates of HTP products with e-cigarettes given the different lengths of time that the products have been available. Differences in the sample demographics between the two KnowledgePanel surveys may also bias the results.

If the history of e-cigarettes offers any guidance, however, then the findings of this study suggest that a significant increase in awareness of HTP will likely lead to a significant increase in experimentation and continued use that could compete with the use of e-cigarettes. Of special concern for the field of public health will be nonsmoking and e-cigarette using adolescents who

may be attracted to new products with designs resembling fresh technology and interesting names such as iQOS.⁵⁸

CONCLUSION

Despite the low awareness of HTP, the early adoption of HTP shows a similar pattern to that of e-cigarettes in their earlier phase. The upcoming regulatory actions by the FDA can significantly change the dynamics of the ENDS market, making it critical to closely monitor the attitudes and behaviours related to HTP by both youth and adult populations in the USA. It is possible that the restriction of the e-cigarette market will mainly work to shift the demand for tobacco harm-reduction products from e-cigarettes to HTP such as iQOS.

What this paper adds

- Heated tobacco products (HTP) have not attracted as much attention in the USA compared with Japan and South Korea, even though they have been suggested as a reduced harm alternative to cigarettes, similar to claims made about e-cigarettes. The Food and Drug Administration's premarket tobacco application authorisation for iQOS, the leading HTP brand, in April 2019 marked an important commercial milestone in the USA.
- This study, based on a national survey, found that the awareness and use of HTP in the USA was relatively low, following the authorisation of iQOS about 9 months before the survey and 3 months after its introduction to the US market.
- The study found, however, a similarity in the adoption process of HTP and that of e-cigarettes: the ratio of those who experimented with HTP after having heard about it (E/H) and the ratio of those who continued to use HTP after having experimented with it (C/E), were quite similar for HTP and e-cigarettes.

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