

# Heated debates on regulations of heated tobacco products in South Korea: the news valence, source and framing of relative risk/benefit

Jungmi Jun <sup>1</sup>, Sei-Hill Kim,<sup>1</sup> James Thrasher,<sup>2</sup> Yoo Jin Cho <sup>2</sup>, Yu-Jin Heo<sup>1</sup>

<sup>1</sup>School of Journalism & Mass Communications, College of Information and Communications, University of South Carolina, Columbia, South Carolina, USA

<sup>2</sup>Department of Health Promotion, Education, and Behavior, Arnold School of Public Health, University of South Carolina, Columbia, South Carolina, USA

## Correspondence to

Dr Jungmi Jun, University of South Carolina System, Columbia, SC 21708, USA; JUNJ@mailbox.sc.edu

Received 30 July 2020

Revised 22 December 2020

Accepted 11 January 2021

## ABSTRACT

**Background** We analyse news representations of the regulation of heated tobacco products (HTPs) in South Korea, the country where HTP use is among the highest in the world despite conflicts between the government and the HTP manufacturers.

**Methods** We analysed a total of 571 print and TV news covering HTP regulations, published between 2017 and 2018, the time period when HTPs were introduced to the country and various regulations of HTPs were proposed and implemented. We assessed the prevalence and associations among specific types of HTP regulations that were discussed, valence towards regulation, sources, framing of the relative health risks/benefits of HTPs compared with conventional cigarettes.

**Results** Taxation (55.2%) and warning labels (25.7%) were two regulation topics covered the most. Almost equal proportions of pro-regulation (2.5%) and anti-regulation valence (2.2%) were found in taxation-related news, while pro-regulation valence appeared more frequently for other restrictions, including warning labels (pro=9.5% vs anti=1.4%), marketing restrictions (pro=6.9% vs anti=0%) and integration of HTPs into smoke-free policies for cigarettes (pro=8.7% vs anti=0%). The government (59%), followed by the tobacco industry (39.4%), was the source cited most often across news stories while the presence of tobacco control advocates was low (4.9%). As for framing, there was no significant difference in the prevalence of stories mentioning reduced harm (31.7%) and equal or more harm (33.6%) of HTPs compared with cigarettes.

**Conclusions** We provide implications for governments and tobacco control advocates on building consensus for applying cigarette equivalent taxes and pictorial warning labels to HTPs.

## INTRODUCTION

Heated tobacco products (HTPs) are electronic devices that heat tobacco-filled sticks to temperatures below combustion to produce aerosols containing nicotine and other chemicals.<sup>1–3</sup> After showing rapid growth in Japan, HTPs entered the South Korean market in June 2017.<sup>4</sup> HTP manufacturers made the products highly accessible, selling HTPs at most convenience stores throughout the nation<sup>5</sup> and using aggressive marketing/promotions.<sup>6</sup> Phillip Morris International (PMI), the manufacturer of an HTP brand—IQOS, publicly claimed that IQOS reduces harmful substances by 90%.<sup>6</sup> HTP sales rapidly grew from 2.2% of the entire tobacco/e-cigarette market in 2017 to 10.4% in 2020.<sup>7</sup>

The Korean Ministry of Health Welfare (KMHW) and the Korean Ministry of Food and Drug Safety (KMFDs) have implemented measures to regulate HTPs as shown in figure 1.<sup>8–10</sup> KMHW has the authority to restrict marketing of HTPs and decide the warning label for HTPs under the National Health Promotion Act (NHPA).<sup>11</sup> KMFDs analysed HTP constituents and announced that HTPs contain an equal level of nicotine and a higher level of tar than cigarettes at a press conference in June 2018.<sup>12</sup> PMI filed a lawsuit against KMFDs<sup>13</sup> and created a website ([www.truthandright.co.kr](http://www.truthandright.co.kr)) counteracting the KMFDs announcement. PMI has continued making reduced exposure claims on IQOS,<sup>6</sup> despite the prohibition of marketing of unproven health effects in the NHPA.<sup>11</sup>

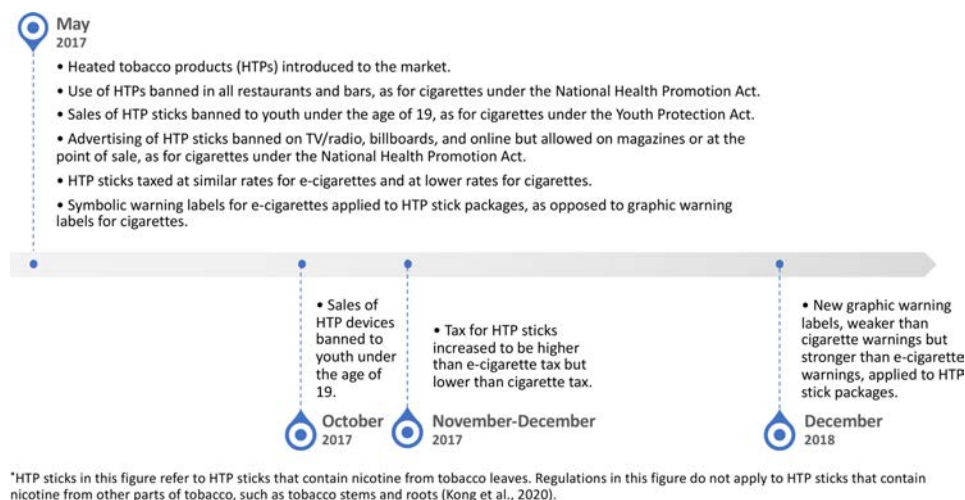
South Korea's early experience of exposure to HTP marketing with reduced exposure claims and intense public health debates is particularly important as it may presage what will happen in the USA and many other countries. PMI and other tobacco companies are rapidly expanding the HTP market around the world, with PMI repeatedly stating that it aims to create a 'smoke-free world' by replacing cigarettes with IQOS and other novel products<sup>14 15</sup> and offering nearly a billion dollar research fund to promote harm reduction strategies.<sup>16</sup> The US Food and Drug Administration (FDA) authorised legal sales of IQOS in April 2019<sup>17</sup> and approved PMI's modified risk tobacco product (MRTP) application in July 2020,<sup>18</sup> allowing marketing of IQOS as containing lower levels of harmful chemicals compared with cigarettes (ie, modified exposure claim). FDA did not allow claims that IQOS is less harmful (ie, modified risk claim), although consumers mostly do not distinguish between these two claims.<sup>19</sup> The WHO<sup>20</sup> and tobacco control advocates have expressed strong opposition to the FDA decision,<sup>21</sup> citing concerns that treating IQOS differently from cigarettes will undermine tobacco control efforts.

We analyse how Korean news media represented HTP regulations over the period of their introduction into the Korean market and subsequent controversies around regulations. To date, there is a lack of research analysing news presentation of HTPs and relevant policy debates. News media are an important source of tobacco information,<sup>22 23</sup> and they can frame tobacco-related discussions among both policymakers and the public. Agenda-setting research has suggested that the amount and type of news coverage of social, political and health issues, such as tobacco control, is a crucial factor in setting the agenda for policy changes.<sup>24</sup> News media can



© Author(s) (or their employer(s)) 2021. No commercial re-use. See rights and permissions. Published by BMJ.

**To cite:** Jun J, Kim S-H, Thrasher J, et al. *Tob Control* Epub ahead of print: [please include Day Month Year]. doi:10.1136/tobaccocontrol-2020-056131



**Figure 1** HTP policy timeline in Korea.

not only set the priority among various issues in a society but also influence the public's attitudes toward such issues.<sup>25</sup> In particular, news media's framing—a way of selecting, organising and packaging information about an issue—can influence the public's perception and consensus on how the issue should be addressed.<sup>26</sup>

Of various agenda setting and framing tactics used by news media, we focus on the source, valence and framing of relative risks or benefits. The source is a person or organisation who provides information to journalists and is explicitly identified by quote or paraphrase, and the presence of sources shapes the news discourse.<sup>27</sup> Although balanced reporting has been an important journalistic norm, news media often reveal their valence—supporting or opposing views to tobacco control objectives directly in opinion pieces or by presenting sources or information that represent only one side of the debate. For example, health-framed news articles were more supportive of tobacco control, while articles using individual rights or political frames were more likely to be against tobacco control.<sup>28–29</sup> In the Korean context, PMI and the Korean Tobacco Association (KTA) consisted of the Korean offices of HTP manufacturers (ie, PMI Korea, British American Tobacco Korea, Japanese Tobacco International Korea and Korea Tobacco & Ginseng Corporation.) are strong actors in public discourses.<sup>30</sup> Meanwhile, the Korean government's procedure of sales authorisation and scientific review for HTPs have been criticised in news media and the grassroots movement for tobacco control advocacy is limited as compared with other high-income countries.<sup>31</sup> We expect this power imbalance between pro-HTP versus anti-HTP actors in Korea will influence news coverage of HTP regulations with typical journalistic practices.

We also examine the frame of relative health risks and benefits of HTPs as compared with cigarettes as this concern has been at the centre of debates on whether HTPs should be regulated the same as or different from cigarettes.<sup>32–33</sup> For instance, inconclusive health effects of HTPs due to the lack of long-term clinical evidence can be framed as emphasising the benefit of HTPs, such as 'no proven harm' or as emphasising the risk of HTPs, such as 'potential harm'. The news media's framing or valence towards an issue have been associated with individual perceptions of the issue and support for related policies.<sup>34–35</sup> For example, the tone of e-cigarette news headlines influenced readers' e-cigarette harm perceptions.<sup>36</sup>

Given the critical roles of news media in shaping tobacco risk perceptions and related policies, we examine the prevalence of various types of HTP regulations, valence towards such regulations and relative risks/benefits of HTPs in Korean news. In so doing, we compare the occurrence of the regulation types, sources and relative risk frames by the valence.

## METHODS

### Data collection

We first selected three national daily newspapers with the largest circulation figures. As these newspapers tend to represent conservative perspectives, we added two largest liberal newspapers and two financial newspapers. As for TV news, data came from seven TV networks (see the note in table 1 for details). News were retrieved from Naver (the largest online search engine and news archive) and the website of each outlet by querying keywords; 'heated tobacco', 'IQOS', 'lii' and 'glo' both in the English and Korean language. The search period from 1 January 2016 (when the first news article on HTPs was published) to 31 December 2018 yielded 1160 articles/transcripts. After removing, duplicates and unrelated stories, 766 articles remained. Of these, we selected articles mentioning 'regulation/enforcement/policy/law/-restriction', 'tax', 'warning', 'controversy/debate/counter-attack' or 'toxic/harm/risk' in the title or the main text. After excluding 195 articles that did not contain any of the regulation-related keywords, the final sample of 571 articles were analysed.

### Coding procedure

Two researchers coded the articles, and two authors supervised the coding. To ensure the inter-coder reliability, they randomly selected and coded about 14% of the data (n=80). After an iterative process of coder training, modification of instructions and retraining, inter-coder reliability was high (Krippendorff's alpha range=0.79–1.0). The researchers coded the rest of sample independently.

### Measures

#### Regulation type

We coded the presence of each of the following ten regulations that appeared in news covering e-cigarettes regulations<sup>27 32 37</sup>—(1) marketing/promotion restrictions, (2) taxation, (3) smoke-free policies restricting HTP use in indoors and public spaces, (4)

**Table 1** Regulation type, source and health frame by the valence toward HTP regulation

		Pro-regulation	Anti-regulation	Mixed	None	
Total n=571	N (%)	24 (4.2)	9 (1.6)	16 (2.8)	522 (91.4)	
Regulation type		%	%	%	%	Pearson $\chi^2$ (p)
Taxation	351 (55.2)	2.5	2.2	3.5	91.7	7.688 (0.053)
Warning labels	147 (25.7)	9.5	1.4	3.4	85.7	14.350 (0.002)
Marketing restrictions	29 (5.1)	6.9	0	0	93.1	1.874 (0.599)
Tobacco-free policies	23 (4.0)	8.7	0	0	91.3	2.220 (0.532)
Youth access restrictions	11 (1.9)	0	0	0	100	1.053 (0.788)
Product definition	6 (1.1)	33.3	0	0	66.7	12.914 (0.005)
Source						
Korean governments	337 (59.0)	5.9	1.5	4.2	88.4	12.087 (0.007)
Tobacco industry	225 (39.4)	4.0	1.8	3.1	91.1	0.263 (0.967)
Tobacco control advocates	28 (4.9)	14.3	0	0	85.7	8.515 (0.036)
Civilians	60 (10.5)	6.7	10	1.7	81.7	32.158 (<0.001)
Foreign institutes/experts	90 (15.8)	7.8	1.1	1.1	90.0	4.508 (0.212)
Relative risk frames						
Reduced harm versus	181 (31.7)	6.6	3.3	5.0	85.1	14.414 (0.002)
Equal harm	192 (33.6)	8.9	0	2.6	88.5	19.749 (<0.001)
	McNemar $\chi^2=680$ (p=0.409)					
No proven harm versus	25 (4.4)	4.0	0	12.0	84.0	8.466 (0.037)
Potential harm	59 (10.3)	10.2	0	0	89.8	8.472 (0.037)
	McNemar $\chi^2=13.613$ (p<0.001)					
Cessation aids versus	8 (1.4)	25	12.5	12.5	50	18.738 (<0.001)
Dual use	29 (5.1)	20.7	0	0	79.3	21.584 (<0.001)
	McNemar $\chi^2=12.903$ (p<0.001)					
Reduced secondhand harm	12 (2.1)	0	16.7	0	83.3	18.656 (<0.001)
Equal secondhand harm	26 (4.6)	11.5	0	0	85.5	4.706 (0.195)
	McNemar $\chi^2=4.971$ (p=0.026)					
Reduced addiction versus	1 (0.2)	0	0	0	100	n.a.
Equal addiction	29 (5.1)	13.8	0	10.3	75.9	14.178 (<0.001)
	McNemar $\chi^2=24.300$ (p<0.001)					

News data come from three national daily newspapers (Chosun Daily, Joonang Daily, Donga Daily); their online editions (Chosun Online, Joongang Online, Donga Online); two largest liberal newspapers (Kyunghyang Newspaper and Hankyoreh Newspaper); financial newspapers (Maeil Finance Daily, Hankook Finance Daily); seven Korean television networks (Korean Broadcasting System (KBS), Munhwa Broadcasting Corporation (MBC), Seoul Broadcasting System (SBS), TV Chosun, Joongang Tongyang Broadcasting Company (JTBC), Channel A and Yonhap Television News TV (YTN)).

warnings labels, (5) youth/minor access restrictions, (6) retailing restrictions, (7) flavours ban, (8) manufacturers/retailers' safety/quality control, (9) possession/carrying restrictions and (10) product definition (HTPs as described in the Korean language includes the term 'e-cigarettes'. The Korean Society for Research on Nicotine and tobacco control advocates have demanded a government action to correct the official label of HTPs to 'heated tobacco/cigarettes' not as e-cigarettes or heat-not-burn in order to distinguish HTPs from e-cigarettes.).

#### News sources

Initially, we coded the presence of 18 types of news sources, looking if each was quoted or referenced. In further analysis, the sources were grouped into five larger categories, adopting stakeholder categories in previous tobacco news content analysis<sup>32 37</sup>; (1) Korean government (eg, KMFDS, KMHW), (2) tobacco industry/HTP manufacturers (eg, PMI, KTA or 'tobacco industry' in Korean language), (3) tobacco control advocates, (4) civilians, (5) foreign experts/governments (eg, WHO, FDA).

#### Valence towards HTP regulation

Coders determined the overall valence and categorised into one of the following four: (1) pro-regulation ('pro-reg' hereafter: overall attitudes towards stringent regulations of HTPs are positive (appropriate/beneficial/effective for public health or other outcomes); (2) anti-regulation ('anti-reg' hereafter: overall attitudes are negative (not appropriate/beneficial/effective); (3) mixed: both pro-reg and anti-reg valence present and both are almost equally prominent; (4) none: no valence appears and the article delivers fact-based information only.

#### Framing of relative risks/benefits

Adopting positive versus negative frames that previous studies have used to describe health impacts of e-cigarettes,<sup>32 33</sup> we coded: (1) reduced harm: HTPs expose people to no/reduced harm compared with cigarettes; (2) equal harm: HTPs expose people to equal/increased harm; (3) no proven harm: there is no scientifically proven harm of HTP usage; (4) potential harm:



additional/unknown harm of HTPs exist; (5) smoking cessation aids: HTPs help smokers to quit or smoke less; (6) dual use: HTPs have no effects on cessation or people become dual users; (7) reduced secondhand harm effects: HTPs are not/less harmful to bystanders; (8) equal secondhand harm effects: HTPs are equally/more harmful to bystanders; (9) reduced addiction: HTPs are not/less addictive; (10) equal addiction: HTPs are equally/more addictive.

### Data analysis

In addition to descriptive analysis, cross-tabulations with Pearson  $\chi^2$  tests were performed to compare the occurrence of regulation type, news source and frames by the valence toward HTP regulation. McNemar  $\chi^2$  tests examined differences in the occurrence of relative risk versus benefit frames.

## RESULTS

Our sample of 571 news articles covering HTP regulation were published between 2017 (n=322) and 2018 (n=249) from 14 news outlets. About one-third (30.5%) were published in daily, 27% in finance newspapers, 27.3% aired in national TV and 15.2% in cable TV. Significant differences by news outlet included more frequent occurrence of anti-reg valence in finance newspapers (4.5% vs daily=0.6%; national/cable TV=1.1%;  $\chi^2=38.40$ ,  $p<0.001$ ) and a lower coverage of warning labels in finance newspapers (18.2% vs daily=29.3%; national/cable TV=28%;  $\chi^2=6.40$ ,  $p=0.041$ ) compared with others.

### Valence towards HTP regulation

As shown in table 1, most news articles were coded as presenting no valence (91.4%). Twenty-four articles (4.2%) presented a pro-reg, nine (1.6%) showed an anti-reg and 16 (2.8%) showed a mixed valence.

### Regulation type

Taxation was covered the most frequently (55.2%) followed by warning labels (25.7%), marketing/promotion restrictions (5.1%), smoke-free policies (4%), youth/minor access restrictions (1.9%) and product definition (1.1%). The presence of other regulations was marginal. As for the valence comparison, the pro-reg (2.5%) versus anti-reg (2.2%) appeared almost equally in articles covering taxation, while more were mixed (3.5%). However, pro-reg appeared more prominently than anti-reg in covering other types of regulations, including warning labels (pro=9.5% vs anti=1.4%), marketing/promotion restrictions (pro=6.9% vs anti=0%), smoke-free policies (pro=8.7% vs anti=0%) and product definition (pro=33.3% vs anti=0%). However, these differences were statistically significant only in articles covering warning labels ( $\chi^2=14.35$ ,  $p=0.002$ ) and product definition ( $\chi^2=12.914$ ,  $p=0.005$ ).

### News sources

Nearly 60% of articles cited a government source and nearly 40% referred to the tobacco industry. Foreign institutes/experts were cited in some articles (15.8%), followed by civilians (10.5%) and tobacco control advocates (4.9%). In articles using a government source, the pro-reg (5.9%) more frequently appeared than anti-reg (1.5%), while some were mixed (4.2%;  $\chi^2=12.08$ ,  $p=0.007$ ). When the tobacco industry was cited, pro-reg (4.0%) appeared more than mixed (3.1%) or anti-reg (1.5%), but this difference was not statistically significant. When tobacco control advocates were cited, anti-reg or mixed valence did not appear, while 14.3% of such articles showed pro-reg.

When civilians were used as a source, the article more frequently showed anti-reg (10%) than pro-reg (6.7%) or mixed valence (1.7%;  $\chi^2=32.158$ ,  $p<0.001$ ).

### Framing of relative risks/benefits

There was no significant difference in the occurrence of reduced harm frame (33.6%) compared with equal harm frame (31.7%). However, the inconclusive health effects of HTPs were more often framed as potential harm (10.3%) than no proven harm (4.4%; McNemar  $\chi^2=13.613$ ,  $p<0.001$ ). The risk of dual use (5.1% vs cessation aids=1.4%; McNemar  $\chi^2=12.903$ ,  $p<0.001$ ), equal secondhand harm to bystanders (4.6% vs reduced secondhand harm=0.2%; McNemar  $\chi^2=4.971$ ,  $p=0.026$ ) and equal chances of addiction (5.1% vs reduced addiction=0.2%; McNemar  $\chi^2=24.30$ ,  $p<0.001$ ) more frequently appeared than their counterparts.

Among articles mentioning reduced harm of HTPs, pro-reg (6.6%) appeared more frequently than other valences (anti-reg=3.3%, mixed=5%;  $\chi^2=14.414$ ,  $p=0.002$ ).

In articles mentioning equal harm of HTPs, anti-reg was not found, 8.9% were pro-reg and 2.6% were mixed valence ( $\chi^2=19.749$ ,  $p<0.001$ ). Similarly, anti-reg did not appear in articles mentioning potential harm, dual use, equal secondhand harm and equal addiction of HTPs. When the cessation effects of HTP were presented, however, anti-reg (12.5%) and mixed valence (12.5%) appeared equally, which was about half as often as pro-reg (25%;  $\chi^2=18.738$ ,  $p<0.001$ ), though it should be noted that this distribution was based on only eight articles. There was no pro-reg or mixed valence in articles mentioning reduced secondhand harm effects of HTPs, while 16.7% of them were coded as anti-reg ( $\chi^2=18.656$ ,  $p<0.001$ ).

## DISCUSSION

We investigated how news media cover regulations of HTPs in South Korea, one of the first countries where HTPs were heavily marketed and use has rapidly grown. We discovered a high volume of relevant news coverage, reflecting the salience of the issue for the Korean public. In addition to the early introduction and the increasing popularity of HTPs, intense controversies between the government and HTP manufacturers—the main sources that Korean news cited—may explain the high news volume. Many news stories presented HTP regulation as a battle between the government and HTP manufacturers, which was amplified when PMI hosted a counter press conference and filed a lawsuit against KMFDS. Conflicts and controversies are important components of newsworthiness,<sup>38</sup> which provide the same opportunity for tobacco control advocates and the tobacco industry to deliver their claims and engage in shaping public discourses using the media attention.<sup>39 40</sup>

Controversies are useful for advocates who aim to raise public awareness of an issue and/or place pressure on decision makers.<sup>38 41</sup> However, Korean tobacco control advocates were rarely present as news sources (less than 5% of stories), suggesting that they did not capitalise on the newsworthiness of industry-government battles around HTPs. In previous research, one-fifths of tobacco-related US news relied on tobacco control advocates as a source,<sup>42</sup> which likely reflects the well-developed network of advocacy organisations and their media advocacy power.<sup>41 43</sup> Given the small number of tobacco control advocates in South Korea,<sup>31</sup> Korean news media may have relatively few advocacy sources. Korean journalists may also prefer government or tobacco industry sources that can provide prompt information (eg, press conferences, press releases) that is

newsworthy.<sup>44</sup> However, when tobacco control advocates were cited, news stories did not present an anti-reg valence, suggesting the potential effectiveness of media advocacy efforts. Advocacy organisations may be able to expand their impact by capturing the public's attention through direct engagement via collaborative networks using social media.<sup>45</sup> Korean tobacco control advocates' strategic social networking and social media advocacy may be a promising area for future research and practice.

Korean news media's referencing both the government and the tobacco industry seems to have resulted in the reduced harm (31.7%) and equal harm (33.6%) frames being used often and almost equally. Korean news media represented both government perspectives on HTP harms to justify regulations and the industry counterarguments focused on relative health benefits of HTPs. Supporting the frame-building perspective,<sup>46 47</sup> our findings demonstrate that the topic, focus and frames in the news depend on the sources selected.

Consistent with previous research,<sup>48</sup> taxation was the key area where a high tension existed between the government and the tobacco industry. Taxation was the only law that drew pro-reg and anti-reg valence almost equally with mixed valence, while anti-reg valence rarely or never appeared for other policy options. The Korean Ministry of Strategy and Finance (KMSF) increased taxes on HTPs to make them comparable to cigarette taxes in November 2017,<sup>8</sup> citing the WHO Framework Convention on Tobacco Control guidelines. Opponents questioned whether the motives were for tax revenue or public health reasons, including whether a tax increase would reduce consumption. PMI stated that a tax on HTP that is equivalent to cigarettes would discourage smokers from switching to HTPs, claiming that all 42 countries selling IQOS apply much lower taxes to IQOS than cigarettes, despite evidence to the contrary from the KMSF.<sup>49</sup> Tobacco taxes have long been a controversial issue that captures media attention,<sup>29 39</sup> likely because it is the most effective way to reduce consumption<sup>50</sup> and, therefore, makes the industry concerned. Prior research in the USA found that news articles during the year when a tax initiative was successful were more likely to include pro-tax arguments about how the tax could raise state revenues and pay for tobacco control programmes; by contrast, in unsuccessful years, more stories presented the lack of consensus on how the tax money should be spent.<sup>39</sup> Future media advocacy efforts to further increase the HTP tax may benefit from communicating more clearly how revenue from HTP taxes will be spent.

South Korea is the first country to require pictorial warning labels on HTPs, and warning labels were mentioned in one-fourths of the news stories, primarily exhibiting an anti-reg or mixed valence. When HTPs entered the market in 2017, their packaging of the sticks was required to include the warning label for e-cigarettes, which described nicotine addiction and showed an image of a needle. In December 2018, the KMHWS replaced warning labels for HTPs to include an image of a cancer-stricken organ and text stating 'addiction to nicotine, exposure to carcinogenic substance'.<sup>9</sup> The tobacco industry argued that warning content should not include imagery of disease as no long-term evidence on HTP health impacts is available.<sup>51</sup> Faced with such industry arguments, government and advocates may wish to emphasise the importance of graphic warning labels for HTPs as a key youth tobacco prevention strategy to which almost no public opposition exists.<sup>52</sup> Indeed, Korean youths' exposure to HTPs and HTP advertising via point of sale is extremely high,<sup>53</sup> as HTPs are displayed, promoted and sold in most convenience stores.<sup>6</sup> Korean youths' trial of HTPs has been reported,<sup>54</sup> and the expansion was faster than that of e-cigarettes.<sup>6</sup>

Our research has several limitations. First, our findings are largely descriptive. Our assessment of relationships among study variables was exploratory because of the novelty of research on HTPs—our intent was to identify the stakeholders who garner media attention and to evaluate key concepts, including the valence and framing, that had been found to be important in previous research on tobacco-related news coverage. Another shortcoming is the limited search period (2017–2018), which we selected because it covered key events in the regulation of HTPs in Korea. However, as in other countries, the tobacco product market and policies to regulate them are changing rapidly. Future research should extend the period to better analyse the cycles and trends around each regulatory issue and novel product introduced into the market. Lastly, our analyses included only news media. Indeed, there has been a recent increase in HTP-related content in social media,<sup>55</sup> where HTP manufacturers reach youth and take advantages of weaker marketing regulations that are difficult to enforce. Social media conversations surrounding HTPs, their regulation and key issues, such as youth appeal should be the focus of future research to better understand HTP policy debates, public responses to regulations and the networks and alliances among stakeholders.

Despite these shortcomings, this is the first analysis of news representations of HTP regulations to date and, as such, contributes to the literature on media and tobacco control. Our findings may assist tobacco control advocates who share similar challenges in the framing battles against the tobacco industry. HTPs have received excise tax rates lower than cigarettes in most countries, and the tax advantages for HTPs may attract both consumers and the tobacco industry to switch to HTPs from cigarettes.<sup>56</sup> It is likely governments in some countries may move to increase HTP taxes equivalent to cigarettes for tobacco control and tax revenue, and such taxations will pose many challenges, as learnt from the Korean case. We suggest the government and advocates communicate clearly about how revenue from HTP taxes would benefit public health. Pictorial warning labels for HTPs can be considered and communicated as a youth prevention

### What this paper adds

#### What is already known on this subject

- Heated tobacco products (HTPs) entered the South Korean tobacco market in June 2017. Debates surrounding HTP regulations before and after their introduction were intense in the country.

#### What important gaps in knowledge exist on this topic

- To date, no published study has analysed news coverage on HTPs and policy debates in any country, and the case study of South Korea is instructive given the popularity of HTPs and challenges that countries increasingly face around HTP regulations.

#### What this paper adds

- Taxation was the law covered the most, with roughly equal representation of pro-regulation and anti-regulation valence, while youth access and marketing restrictions regarding HTPs were rarely discussed, although these topics tended to be presented with a pro-regulation valence.
- The Korean government and the tobacco industry were the dominant sources in HTP regulations news. Tobacco advocacy groups were very rarely cited, suggesting a need for stronger media advocacy efforts to support HTP regulations.

programme, given HTPs' appeal to young people<sup>6 57 58</sup> and the increase of youths trying HTPs.<sup>54 57 59</sup> Tobacco control advocates should enhance their domestic and international networks and more actively reach out to news media to counteract the tobacco industry's influence on news valence and framing.

**Contributors** JJ conducted data analysis and led the manuscript development. S-HK supervised the data collection and contributed to the manuscript development. JT supervised the data collection and contributed to the manuscript development. YJC collected the data and contributed to the manuscript development. Y-JH collected the data.

**Funding** The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

**Competing interests** None declared.

**Patient consent for publication** Not required.

**Provenance and peer review** Not commissioned; externally peer reviewed.

**Data availability statement** Data are available upon reasonable request. Data will be available upon request to the corresponding author.

#### ORCID iDs

Jungmi Jun <http://orcid.org/0000-0002-0720-7122>

Yoo Jin Cho <http://orcid.org/0000-0001-9590-9206>

#### REFERENCES

- Caputi TL. Industry watch: heat-not-burn tobacco products are about to reach their boiling point. *Tob Control* 2017;26:609–10.
- O'Connell G, Wilkinson P, Bursack K. Heated tobacco products create side-stream emissions: implications for regulation. *J Environ Anal Chem* 2015;02.
- WHO. Heated tobacco products (HTPs) information sheet, 2020. Available: [http://www.who.int/tobacco/publications/prod\\_regulation/heated-tobacco-products/en/](http://www.who.int/tobacco/publications/prod_regulation/heated-tobacco-products/en/) [Accessed 1 Feb 2020].
- Kim M. Philip Morris international introduces new heat-not-burn product, IQOS, in South Korea. *Tob Control* 2018;27:e76–8.
- Jin B. IQOS, glo, lil shake the tobacco marketing, the rapid increase of HTPs at convenience stores. New Dly, 2018. Available: <http://biz.newdaily.co.kr/site/data/html/2018/01/22/2018012210046.html> [Accessed 27 Jan 2020].
- Kim J, Yu H, Lee S, et al. Awareness, experience and prevalence of heated tobacco product, IQOS, among young Korean adults. *Tob Control* 2018;27:s74–7.
- Ministry of Economy and Finance of Korea. Tobacco market trend in the first half of 2020, 2020. Available: [http://www.moef.go.kr/nw/nes/detailNesDtaView.do?searchBbsId1=MOSFBBS\\_000000000028&searchNttId1=MOSF\\_000000000041727&menuNo=4010100](http://www.moef.go.kr/nw/nes/detailNesDtaView.do?searchBbsId1=MOSFBBS_000000000028&searchNttId1=MOSF_000000000041727&menuNo=4010100)
- Korean Ministry of Government Legislation. The law of sales tax on electronic cigarettes and heated tobacco products, 2017. Available: <http://www.clhs.co.kr/informread.asp?id=1967> [Accessed 1 Feb 2020].
- Korean Ministry of Health and Welfare. New manual of tobacco warning labels, 2018. Available: [http://www.mohw.go.kr/react/al/sal0301vw.jsp?PAR\\_MENU\\_ID=04&MENU\\_ID=0403&CONT\\_SEQ=346357&page=1](http://www.mohw.go.kr/react/al/sal0301vw.jsp?PAR_MENU_ID=04&MENU_ID=0403&CONT_SEQ=346357&page=1) [Accessed 29 Jan 2020].
- Korean Center for Disease Control. Electronic cigarettes and heated tobacco products, 2020. Available: [http://health.cdc.go.kr/health/mobileweb/content/group\\_view.jsp?currentPage=1&dp2code=101119000000&dp3code=&dp4code=&CID=5XEP61PCDG](http://health.cdc.go.kr/health/mobileweb/content/group_view.jsp?currentPage=1&dp2code=101119000000&dp3code=&dp4code=&CID=5XEP61PCDG) [Accessed 29 Jan 2020].
- Korean Ministry of Health & Welfare. National health promotion act, 2020. Available: <http://www.law.go.kr/lsInfoP.do?lsSeq=220881&efYd=20200912#0000>
- KFDA. Heated tobacco products pose a higher level of TAR than cigarettes, 2018. Available: [https://www.mfds.go.kr/brd/m\\_99/view.do?seq=42316](https://www.mfds.go.kr/brd/m_99/view.do?seq=42316) [Accessed 29 Jan 2020].
- hankyung.com. Philip Morris sue the Korean FDA - disclose the evidence of the harm claim, 2018. Available: <https://www.hankyung.com/economy/article/201810010713Y> [Accessed 1 Feb 2020].
- Daube M, Moodie R, McKee M. Towards a smoke-free world? Philip Morris international's new Foundation is not credible. *Lancet* 2017;390:1722–4.
- Koh HK, Geller AC. The Philip Morris international-funded foundation for a smoke-free world. *JAMA* 2018;320:131.
- smokefreeworld.org. Home, 2020. Available: <https://www.smokefreeworld.org/> [Accessed 9 Oct 2020].
- FDA. FDA permits sale of IQOS tobacco heating system through premarket tobacco product application pathway, 2019. Available: <http://www.fda.gov/news-events/press-announcements/fda-permits-sale-iqos-tobacco-heating-system-through-premarket-tobacco-product-application-pathway> [Accessed 8 Jul 2019].
- FDA. FDA authorizes marketing of IQOS tobacco heating system with 'reduced exposure' information, 2020. Available: <https://www.fda.gov/news-events/press-announcements/fda-authorizes-marketing-iqos-tobacco-heating-system-reduced-exposure-information> [Accessed 7 Sep 2020].
- Popova L, Lempert LK, Glantz SA. Light and mild redux: heated tobacco products' reduced exposure claims are likely to be misunderstood as reduced risk claims. *Tob Control* 2018;27:s87–95.
- WHO. WHO statement on heated tobacco products and the US FDA decision regarding IQOS, 2020. Available: <https://www.who.int/news-room/detail/27-07-2020-who-statement-on-heated-tobacco-products-and-the-us-fda-decision-regarding-iqos> [Accessed 7 Sep 2020].
- AHA. FDA puts kids, public health at risk by allowing Philip Morris to market IQOS heated cigarette as modified risk tobacco product, 2020. Available: <https://newsroom.heart.org/news/fda-puts-kids-public-health-at-risk-by-allowing-philip-morris-to-market-iqos-heated-cigarette-as-modified-risk-tobacco-product> [Accessed 7 Sep 2020].
- Brodie M, Hamel EC, Altman DE, et al. Health news and the American public, 1996–2002. *J Health Polit Policy Law* 2003;28:927–50.
- Wackowski OA, Sontag JM, Hammond D. Youth and young adult exposure to and perceptions of news media coverage about e-cigarettes in the United States, Canada and England. *Prev Med* 2019;121:7–10.
- Long M, Slater MD, Lysengen L. Us news media coverage of tobacco control issues. *Tob Control* 2006;15:367–72.
- McCombs ME, Shaw DL. The Agenda-Setting function of mass media. *Public Opin Q* 1972;36:176.
- Entman RM. Framing: toward clarification of a fractured paradigm. *J Commun* 1993;43:51–8.
- Myers AE, Southwell BG, Ribisl KM, et al. Setting the agenda for a healthy retail environment: content analysis of US newspaper coverage of tobacco control policies affecting the point of sale, 2007–2014. *Tob Control* 2017;26:406–14.
- Bach LE, Shelton SC, Moreland-Russell S, et al. Smoke-free workplace ballot campaigns: case studies from Missouri and lessons for policy and media advocacy. *Am J Health Promot* 2013;27:e124–33.
- Harris JK, Shelton SC, Moreland-Russell S, et al. Tobacco coverage in print media: the use of timing and themes by tobacco control supporters and opposition before a failed tobacco Tax initiative. *Tob Control* 2010;19:37–43.
- Hwang J-E, Cho S-I, Lee SG. Setting the policy agenda for graphic health warning labels: an analysis of online news media coverage in South Korea, 2016. *Tob Induc Dis* 2020;18:64.
- Katanoda K, Jiang Y, Park S, et al. Tobacco control challenges in East Asia: proposals for change in the world's largest epidemic region. *Tob Control* 2014;23:359–68.
- Kim S-H, Thrasher JF, Kang M-H, et al. News media presentations of electronic cigarettes: a content analysis of news coverage in South Korea. *J Mass Commun Q* 2017;94:443–64.
- Wackowski OA, Giovenco DP, Singh B, et al. Content analysis of US news stories about e-cigarettes in 2015. *Nicotine Tob Res* 2018;20:1015–9.
- de Vreese C. The effects of strategic news on political cynicism, issue evaluations, and policy support: a two-wave experiment. *Mass Communication and Society* 2004;7:191–214.
- De Vreese CH, Semetko HA. Cynical and engaged: strategic campaign coverage, public opinion, and mobilization in a referendum. *Commun Res* 2002;29:615–41.
- Tan ASL, Lee C-J, Nagler RH, et al. To vape or not to vape? effects of exposure to conflicting news headlines on beliefs about harms and benefits of electronic cigarette use: results from a randomized controlled experiment. *Prev Med* 2017;105:97–103.
- Patterson C, Hilton S, Weishaar H. Who thinks what about e-cigarette regulation? A content analysis of UK newspapers. *Addiction* 2016;111:1267–74.
- Wallack LM. *Media advocacy and public health: power for prevention*. Newbury Park: Sage Publications, 1993.
- Thrasher JF, Kim S-H, Rose I, et al. Print media coverage around failed and successful tobacco Tax initiatives: the South Carolina experience. *Am J Health Promot* 2014;29:29–36.
- Thrasher JF, Kim S-H, Rose I, et al. Media coverage of smoke-free policies after their innovation. *J Health Commun* 2015;20:297–305.
- Chapman S. *Public health advocacy and tobacco control: making smoking history*. Oxford; Malden, MA: Blackwell Pub, 2007.
- Wakefield MA, Brennan E, Durkin SJ, et al. Making news: the appearance of tobacco control organizations in newspaper coverage of tobacco control issues. *Am J Health Promot* 2012;26:166–71.
- Niederdeppe J, Farrelly MC, Wenter D. Media advocacy, tobacco control policy change and teen smoking in Florida. *Tob Control* 2007;16:47–52.
- Shoemaker PJ, Reese SD. *Mediating the message: theories of influences on mass media content*. New York: Longman, 1991.
- Saffer AJ, Yang A, Morehouse J, et al. It takes a village: A social network approach to NGOs' international public engagement. *American Behavioral Scientist* 2019;63:1708–27.
- Kim S-H, Carvalho JP, Davis AC. Talking about poverty: news framing of who is responsible for causing and fixing the problem. *Journal Mass Commun Q* 2010;87:563–81.

- 47 Scheufele DA. Framing as a theory of media effects. *J Commun* 1999;49:103–22.
- 48 Cho KS, Yoon J. The relationship between press release and newspaper coverage of tobacco-related issues in South Korea. *Glob Health Promot* 2019;26:51–60.
- 49 Noh H. Debates on IQOS taxation interrupt Congress implementation. *Hankyurae*, 2017. Available: [http://www.hani.co.kr/arti/economy/economy\\_general/813399.html](http://www.hani.co.kr/arti/economy/economy_general/813399.html) [Accessed 26 Jul 2020].
- 50 U.S National Cancer Institute and World Health Organization. The economics of tobacco and tobacco control. In: *National cancer Institute tobacco control monograph 21. NIH publication No. 16-CA-8029A*. Bethesda, MD: U.S. Department of Health and Human Services, National Institutes of Health, National Cancer Institute; and Geneva, CH: World Health Organization, 2016.
- 51 Oh D. PMI - pictorial warnings for IQOS should be less repulsive. Seoul Press, 2018. Available: <https://www.seoul.co.kr/news/newsView.php?id=20180618500120> [Accessed 26 Jul 2020].
- 52 Foster C, Thrasher J, Kim S-H, *et al*. Agenda-building influences on the news media's coverage of the U.S. food and drug administration's push to regulate tobacco, 1993–2009. *J Health Hum Serv Adm* 2012;35:303–30.
- 53 Korean Ministry of Health and Welfare. Report of youth exposure to tobacco advertising, 2019. Available: [http://www.mohw.go.kr/react/all/sal0301vw.jsp?PAR\\_MENU\\_ID=04&MENU\\_ID=0403&CONT\\_SEQ=348718&page=1](http://www.mohw.go.kr/react/all/sal0301vw.jsp?PAR_MENU_ID=04&MENU_ID=0403&CONT_SEQ=348718&page=1) [Accessed 19 Jun 2020].
- 54 Kang SY, Lee S, Cho H-J. Prevalence and predictors of heated tobacco product use and its relationship with attempts to quit cigarette smoking among Korean adolescents. *Tob Control* 2020:tobaccocontrol-2019-055114.
- 55 Jun J. Social response to the FDA authorization of heated tobacco products (HTPs): the valence, risk/benefit, and comparison with cigarettes and e-cigarettes. *Tob Regul Sci* 2020;6:20–9.
- 56 Liber AC. Heated tobacco products and combusted cigarettes: comparing global prices and taxes. *Tob Control* 2019;28:689–91.
- 57 Czoli CD, White CM, Reid JL, *et al*. Awareness and interest in IQOS heated tobacco products among youth in Canada, England and the USA. *Tob Control* 2020;29:89–95.
- 58 McKelvey K, Popova L, Kim M, *et al*. Heated tobacco products likely appeal to adolescents and young adults. *Tob Control* 2018;27:s41–7.
- 59 Kang H, Cho S-il. Heated tobacco product use among Korean adolescents. *Tob Control* 2019:tobaccocontrol-2019-054949.