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# Waterpipe tobacco smoking (WTS) control policies: global analysis of available legislation and equity considerations

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## ABSTRACT

**Introduction** The Framework Convention on Tobacco Control (FCTC) offers guidance on evidence-based policies to reduce tobacco consumption and its burden of disease. Recently, it has provided guidance for alternative tobacco products, such as the waterpipe. Waterpipe tobacco smoking (WTS) is prevalent worldwide and policies to address it need to take into consideration its specificities as a mode of smoking. In parallel, a growing body of literature points to the potential of evidence-based tobacco control policies to increase health inequities. This paper updates a previous global review of waterpipe tobacco policies and adds an equity lens to assess their impact on health inequities.

**Methods** We reviewed policies that address WTS in 90 countries, including 10 with state-owned tobacco companies; 47 were included in our final analysis. We relied primarily on the Tobacco-Free Kids organisation's Tobacco Control Laws website, providing access to tobacco control laws globally. We categorised country tobacco policies by the clarity with which they defined and addressed waterpipe tobacco in relation to nine FCTC articles. We used the PROGRESS (Place of residence, Race/ethnicity/culture/language, Occupation, Gender/sex, Religion, Education, Socioeconomic status and Social capital) framework for the equity analysis, by reviewing equity considerations referenced in the policies of each country and including prevalence data disaggregated by equity axis and country where available.

**Results** Our results revealed very limited attention to waterpipe policies overall, and to equity in such policies, and highlight the complexity of regulating WTS. We recommend that WTS policies and surveillance centre equity as a goal.

**Conclusions** Our recommendations can inform global policies to reduce WTS and its health consequences equitably across population groups.

## INTRODUCTION

Waterpipe tobacco smoking (WTS) prevalence has been increasing over the past two decades—mostly driven by youth use—in many countries around the world, mainly located in the Eastern Mediterranean and European regions.<sup>1</sup> The health-related harms caused by WTS are well documented and mirror those caused by cigarettes.<sup>2–5</sup> In addition, the sharing of waterpipes between users carries risk of spread of infectious diseases.<sup>6,7</sup>

The rapid global spread of WTS has been linked to a variety of factors, including a lack of

waterpipe-specific regulations.<sup>5,8</sup> The unique features of WTS in comparison with cigarettes, such as the tobacco itself (flavouring and packaging), waterpipe components (hose, mouthpiece, liquid, base), toxicant exposure and physiological effects, WTS use patterns (in homes and restaurants or cafes), positive social norms associated with it, and the lax policy environment, require specific attention in policy regulation, and adaptation of the guidance usually focused solely on cigarettes.<sup>9,10</sup> The guiding document for global tobacco control regulation is the Framework Convention on Tobacco Control (FCTC), the world's first global health treaty, which includes evidence-based policy recommendations translated through required 'articles'. Research evidence and reports from the Conference of the Parties (COP) to the FCTC on global regulatory practices have documented potentially effective regulatory practices for WTS,<sup>11–14</sup> such as using waterpipe-specific health warning labels. As a result, global health guidance is emerging on WTS-specific policies.<sup>15–18</sup>

Even beyond these policy recommendations, tobacco control advocates have begun to discuss the tobacco 'endgame'—a vision of less than 5% population prevalence of tobacco smoking. Achieving the endgame will require fundamental shifts in the 'structural, political and social dynamics that sustain the (tobacco) epidemic'.<sup>19</sup> Several strategies for reaching this target have been suggested,<sup>20</sup> including a focus on supply-oriented endgame models, such as state-owned tobacco companies (SOTC).<sup>21,22</sup> Analysis of the scope of conflicts of interest related to SOTC and robust tobacco control policies suggests potential for a partial alignment of interests, based on WHO's guidance on implementation of Article 5.3 of the FCTC, which includes the suggestion 'to impose a requirement (on SOTC) to consider social and environmental consequences and to take certain steps to address those consequences'.<sup>21</sup> Given the increasing rhetoric in the scientific and advocacy community around the endgame strategy and the importance of regulation of alternative tobacco products such as WTS to achieving the endgame,<sup>23</sup> beginning to explore the scope of WTS policies and the extent to which social and environmental consequences are considered in countries with SOTC is critical.

In principle, policy development and enforcement covers the whole population and therefore is assumed to be equitable. Yet a growing body of literature points to the potential for tobacco control

policies to increase inequities.<sup>19–22 24 25</sup> Applying an equity lens to policies goes beyond disaggregating data by sociodemographics to considering ‘social, behavioral, economic and environmental determinants, and (working) collaboratively with community stakeholders’.<sup>26</sup> Systematic reviews of population-level general tobacco control interventions and policies for youth and adults found a majority to have negative, mixed or unclear impacts on inequities.<sup>27–29</sup> This has led to calls to adopt an equity perspective to tobacco control policymaking<sup>30</sup> and use theory as a guide.<sup>28</sup> Several frameworks/theories generally,<sup>31–34</sup> and specific to tobacco control,<sup>35 36</sup> allow careful analysis of policies in relation to health equity outcomes. Many highlight the critical need for attention to the political, economic and structural determinants of health—and for the importance of shifting power dynamics—for significant decreases in inequities to occur. WTS has rarely been a specific focus of studies on equity outcomes of policies. Comparisons of WTS prevalence by sociodemographic characteristics are common, but not analysed from a broader equity lens (eg, refs 8 25 31 32 37).

The aim of this paper is to assess the current status of specific waterpipe tobacco (WT) policies globally using nine FCTC articles as a reference. In this process, we provide an update to the Jawad *et al*<sup>38</sup> policy review. We also specifically include countries with SOTC to explore their potential to advance the endgame strategy. Further, this paper will use the PROGRESS framework to apply an equity lens to the policies and analyse prevalence data to highlight differences in WTS. The PROGRESS framework recommends stratification of data by Place of residence, Race/ethnicity/culture/language, Occupation, Gender/sex, Religion, Education, Socioeconomic status and Social capital.<sup>33</sup> The framework ‘highlight[s] the multidimensionality of the distribution of health among population subgroups’ and is helpful in understanding the impact of policies on equity.<sup>34</sup>

## METHODS

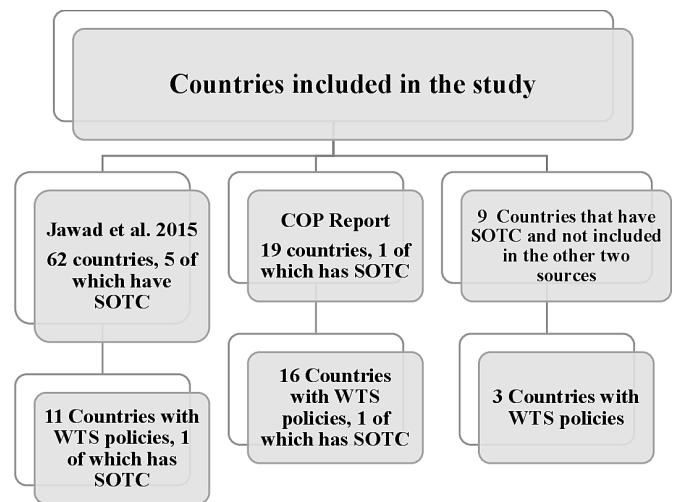
We used publicly available data sources to abstract information to (1) identify countries with legislation that addresses WTS and (2) identify WTS prevalence data for these corresponding countries. For the equity analyses, given the dearth of attention to inequities in relation to WTS, we chose to apply a relatively straightforward framework: PROGRESS.<sup>34 35</sup>

In the following sections, we describe the data sources, eligibility criteria, search strategy and data abstraction processes.

### WTS legislation

Our main source of data on WTS policy-relevant legislation was the ‘Tobacco Control Laws’ (TCL) website,<sup>36</sup> a project of the International Legal Consortium of the Campaign for Tobacco-Free Kids. This website provides a one-stop-shop to analyse country-related policies organised along themes consistent with FCTC articles. Jawad *et al*<sup>38</sup> also relied on this site, so screening of countries began with the list of countries included in that paper (n=62). We then updated that list with countries included in a more recent WHO FCTC COP report on regulatory practices related to waterpipe use (n=19).<sup>18</sup> Finally, we supplemented this list by including countries with SOTC found in Hogg *et al*<sup>21</sup> that were not included in either of the other lists (n=9). Thus, a total of 90 countries were screened within the TCL website for policies related to WTS (see online supplemental appendix 1).

Some countries had one tobacco control policy, while others had several policies related to tobacco control. We extended our search beyond the TCL website for four countries. These included Jordan, whose law on the TCL website was only in



**Figure 1** Flow chart of screening and selection. COP, Conference of the Parties; SOTC, state-owned tobacco companies; WTS, waterpipe tobacco smoking.

draft form; Egypt, which the authors knew had a WTS-specific health warning law that was not on the TCL website; the Netherlands, whose law on the TCL website was in Dutch; and the UK, given potential changes to regulations resulting from Brexit which led to finding an additional policy document for Wales. We found relevant documents in all these cases except for the Netherlands (no translation was found) and Jordan.

### Eligibility criteria

For the country tobacco control policies to be included in our review, the word waterpipe or related words (water pipe, shisha, chicha, hookah, hukkah, nargileh, argileh, argihleh, narghileh, hubble bubble, hobble bobble) had to be mentioned at least once in any of the country’s policy document.<sup>38 39</sup> Contrary to Jawad *et al*,<sup>38</sup> we did not include countries that only referenced FCTC Article 1(f), which defines tobacco products as ‘products entirely or partly made of the leaf tobacco as raw material which are manufactured to be used for smoking, sucking, chewing or snuffing’. Generic definitions of tobacco products that do not specifically include waterpipe (or its related words) are open to interpretation and lead to wide variation in implementation. This was the only difference in the categorisation of country WTS policies as compared with Jawad *et al*.<sup>38</sup>

The initial screening led to identifying 53 countries that met the above eligibility criteria. Six countries (Argentina, Canada, Jordan, Laos, Namibia, South Africa) were excluded from further analysis as they only referred to waterpipe as an accessory/device and did not link it to any FCTC article. Regulating only accessories is not sufficient and is potentially an attempt to circumvent actual effective legislation. For the other 47 countries, we reviewed the entire content of the policy and abstracted any text that mentioned waterpipe. Figure 1 is a flow chart of the screening and selection process.

### Document analysis search strategy

Two reviewers independently reviewed each country’s legislation and abstracted any portion of the document that included the word waterpipe (or related search terms), its definition and specifically any regulation associated with the following nine articles of the FCTC: 6, 8–16. These articles suggest evidence-based regulation in the following areas:

- ▶ Article 6: price and tax measured to reduce demand for tobacco.
- ▶ Article 8: protection from exposure to tobacco smoke.
- ▶ Article 9: regulation of the contents of tobacco products.
- ▶ Article 10: regulation of tobacco product disclosure.
- ▶ Article 11: packaging and labelling of tobacco products.
- ▶ Article 12: education, communication, training and public awareness.
- ▶ Article 13: tobacco advertising, promotion and sponsorship.
- ▶ Article 14: demand reduction measures concerning tobacco dependence and cessation (we combined Articles 12 and 14 in our analysis).
- ▶ Article 15: illicit trade in tobacco products.
- ▶ Article 16: sales to and by minors.

Subsequently, reviewers assessed any association of the word waterpipe with PROGRESS equity-related axes.

#### Data abstraction

The research team developed a spreadsheet which was used by the two reviewers to independently abstract data. In case of disagreements, a third or/and fourth reviewer (authors on this paper) were consulted.

#### Data analysis

We used document analysis as our analytical tool, specifically considering ‘documents as sources’.<sup>40</sup> In this method of document analysis, ‘the researcher is interested in what documents reveal about the real (material) world, how they reflect the actions or interests of political actors or how they describe the contents of a given law’ (185).<sup>40</sup> This allowed the analysis of WTS country tobacco policies and resulted in the categorisation of five types of policy (table 1).

#### Category 1

The definition of a ‘tobacco product’ includes WT. WT is not mentioned specifically in any of the remaining policy clauses. The assumption is that it is regulated throughout the policy wherever the term ‘tobacco product’ is used.

#### Category 2

The tobacco product definition includes WT, and the policy specifically addresses WT in at least some articles.

#### Category 3

The tobacco product definition includes WT. However, they specifically exclude WT in some articles where other tobacco products are addressed.

#### Category 4

The tobacco product definition is generic and does not refer to any specific product including WT. However, specific policy documents or clauses address WT. We subcategorised this category into subcategory A: the country has a specific decree or legal notice related to waterpipe; and subcategory B: WT is mentioned in one article of the law.

The document analysis also allowed the identification and description of any equity-related content in the policy, along the PROGRESS axes.

#### Prevalence data

We searched for data on WTS prevalence in the 47 countries whose policies included content related to WTS. We originally explored many commonly used global-level health databases (online supplemental table 2). However, we found only a few that reported WTS prevalence data.

#### Eligibility criteria

We used only publicly available data, documenting prevalence from 2015 to March 2020. We only included national-level WTS prevalence data and only when it was disaggregated from other tobacco or non-cigarette products.

#### Search strategy

From the databases, we included any indicators that measured waterpipe or any variation, such as ‘water pipe’, ‘narguileh’, ‘hookah’, ‘hukkah’, ‘shisha’, ‘waterpipe with tobacco’ and ‘calean with tobacco’, among ‘current smokers’ (defined varying across different data sources). These terms differ slightly from the policy search terms as we relied on terms used in the reports.

#### Data abstraction

Two reviewers independently extracted the data into a spreadsheet by capturing information from all sources as reported. This spreadsheet was then used for manipulation as presented in the results section.

#### Data analysis

We extracted the data pertaining to WTS prevalence as reported in the surveys and found that, of the 47 countries included in the policy analysis, 25 reported at least one measure of WTS prevalence. We found seven countries that reported WTS prevalence across two data sets. For the extraction to include an equity lens, we considered the PROGRESS framework. For countries where

**Table 1** Description of categories of WT policy

Category of WT policy*	Description	Included countries*
1	The tobacco product definition includes WTS.	Azerbaijan, Chad, Costa Rica, Ecuador, France, India, Iraq, Kingdom of Saudi Arabia, Moldova, Pakistan, Panama, Philippines, Serbia, Vietnam, Yemen.
2	The tobacco product definition includes WTS and they specifically address WTS in all or some articles.	Afghanistan, Bahrain, Russia, Singapore, Turkey, United Arab Emirates.
3	The tobacco product definition includes WTS. However, they specifically focus on other tobacco products in some articles, which intentionally exclude WTS.	Bulgaria, Czech Republic, England, Northern Ireland, Poland, Portugal, Scotland, Slovakia, Slovenia, Sweden, Wales.
4A	The policy has a generic definition of tobacco products that does not specifically include WT but there are specific decrees or legal notices related to WT.	Brazil, Kenya, Niger, Rwanda, Syria, Thailand.
4B	The policy has a generic definition of tobacco products that does not specifically include WT but specific clauses within the policy address WT.	Estonia, Egypt, Ireland, Nigeria, Norway, Uganda, Ukraine.

\*The table includes 45 (not 47) countries. Lebanon and Mauritius are not categorised as they do not even define a tobacco product in their laws and therefore are outside of this categorisation. WT, waterpipe tobacco; WTS, waterpipe tobacco smoking.

**Table 2** WTS definitions in the tobacco policies by country

Country	Scope of definition of WT product
European Union countries (12): Bulgaria, Czech Republic, France, England, Northern Ireland, Poland, Portugal, Scotland, Serbia, Slovakia, Slovenia, Wales	Use the definition of Tobacco Products Directive (2014/40/EU) Article 2.13. 'waterpipe tobacco: 'waterpipe tobacco' means a tobacco product that can be consumed via a waterpipe. For the purpose of this Directive, waterpipe tobacco is deemed to be a tobacco product for smoking. If a product can be used both via waterpipes and as roll-your-own tobacco, it shall be deemed to be roll-your-own tobacco'.
Gulf Cooperation Council countries (3): Bahrain, Kingdom of Saudi Arabia, United Arab Emirates	Use the definition of GCC Standards Organization Labelling of Tobacco Product Packages GSO 246/2011 (2011). 'Moassel Tobacco: Finely cut tobacco derived from a mix of plants of the <i>Nicotiana tabacum</i> and <i>Nicotiana rustica</i> species and/or any mix of both to which is added sugarcane syrup (black honey) or black honey, molasses and glycerin'. 'Tobacco Molasses: Shredded tobacco obtained through a blend of <i>Nicotiana Rustica</i> plants and/or any blend thereof. It may be mixed with syrup, glycerol, oils, and permitted aromatic essences. It is smoked in a hookah (also known as sheesha or Argilah) or anything similar'.
Costa Rica	'Tobacco for a water pipe: Composed of a blend of tobacco and glycerol, including oils and aromatic extracts, molasses or sugar, aromatic or flavoring agents'.
Kenya	'"shisha" includes tobacco products that may be flavored or not flavored that are consumed using a single or multi-stemmed smoking instrument that contains water or other liquid through which the smoke passes before reaching the smoker and whose syrup tobacco content includes molasses, honey, vegetable glycerol and fruit flavours including apple, grape, guava, lemon and mint'. '"shisha smoking" means a form of consumption of shisha that utilize a single or multi-stemmed smoking instrument to smoke shisha where the smoke is designed to pass through water or other liquid before reaching the smoker'.
Moldova	'waterpipe tobacco - means a tobacco product that can be consumed via a waterpipe. For the purpose of this Law, waterpipe tobacco is deemed to be a tobacco product for smoking'.
Singapore	'Shisha tobacco, that is, any mixture containing tobacco intended for smoking in a water pipe, whether or not containing glycerol, aromatic oils, aromatic extracts, molasses or sugar, and whether or not flavoured with fruit'.
Turkey	'Hookah tobacco product: A tobacco product that is consumed through a process of burning and exclusively smoked with a hookah'.
Yemen	Uses the GCC definition, although not a GCC country but considered a member of the GSO.
Russia	Tobacco for a hookah: a type of smoking tobacco product intended for smoking with the use of a hookah and being a mixture of chopped or torn raw material for the production of tobacco products with the addition or without the addition of non-tobacco raw material and other ingredients; Technical Regulations for Tobacco Products (2008). 'tobacco for the hookah': a type of smoking tobacco product, designated for smoking using the hookah and consisting of a mixture of chopped or torn materials with or without the addition of ingredients; Russia - Euroasian Economic Commission Council-Technical Regulations for Tobacco Products. 2014.

GCC, Gulf Cooperation Council; GSO, GCC Standardization Organization; WT, waterpipe tobacco; WTS, waterpipe tobacco smoking.

WTS was reported over two or more data sets, we used the most recent report. We report bivariate results by the PROGRESS equity axes as reported in the data sources.

## RESULTS

### Policy analysis

Within the 47 country policies, 22 provided a definition of what they considered to be a WT product (table 2). Additionally, within the policies, irrespective of definition, waterpipe was referred to as a smoking device by 2 countries (Lebanon, Mauritius), as a smoking device *and* a tobacco product by 8 countries (Azerbaijan, Costa Rica, Estonia, Iraq, Thailand, United Arab Emirates, Uganda, Russia), or only as a tobacco product by the remaining 37 countries.

Out of the 47 countries, 21.3% are in the East Mediterranean Region (EMR), 6.4% are in Western Pacific Region (WPR), 44.7% are in the European Region (EUR), 10.6% are in the South-East Asia Region (SEAR), 8.5% are in the Region of the Americas (AMR) and 8.5% are in the African Region (AFR). Out of the 44 countries categorised by the World Bank (excluding Wales, Scotland and Northern Island, which were not categorised by the World Bank), 18.2% were low-income economy (LIE), 34.1% were high-income economy (HIE), 29.5% were upper middle-income economy (UMIE) and 18.2% were low middle-income economy (LMIE).

Within category 1, 8.5% of the countries are in the EUR, 2.1% in the AFR, 6.4% in the AMR, 8.5% in the EMR and 4.3% in the WPR. These countries were distributed as follows: 9.1% belonged to LMIE, 4.5% belonged to HIE, 6.8% belonged to LIE and 13.6% belonged to UMIE. Within category 2, 8.5% of the countries are in the EUR, 6.4% in the EMR and 2.1% in the WPR. These countries were distributed as follows: 6.8%

belonged to HIE, 2.3% belonged to LIE and 4.5% belonged to UMIE. Within category 3, 23.4% are in the EUR, out of which 15.9% were HIE and 2.3% UMIE. Within category 4A, 2.1% are in the AMR, 2.1% in the EMR, 2.1% in the SEAR and 6.4% in the AFR. These countries were distributed as follows: 2.3% were LMIE, 6.8% were LIE and 4.5% were UMIE. Within category 4B, 8.5% are in the EUR, 2.1% in the EMR and 4.3% in the SEAR. These countries were distributed as follows: 6.8% were HIE, 2.3% were LIE and 6.8% were LMIE.

### Categorisation of policies in relation to WT

Overall, 32% of countries with WTS policies were classified as category 1, 13% as category 2, 23% as category 3, 13% as category 4A and 15% as category 4B (table 1). Due to word limitations, we include exemplar content from only one relevant country policy document for each category described in the Methods section.

#### Category 1

Fifteen countries had WTS policies that fell into category 1. Vietnam defines a tobacco product as the following: 'Tobacco means a product made from the whole or part of the tobacco material processed in the form of cigarette, cigar, loose tobacco fiber, *water pipe tobacco* and other types' (Vietnam - 2012 Tobacco Control Law).

#### Category 2

Six countries had WTS policies that fell into category 2. In Russia, an amendment was introduced in 2020 to several federal laws that entailed the addition of the word hookah to the articles in text. As one example, in the Code of the Russian Federation

on administrative violations, it was recommended to ‘supplement the title after the word “tobacco” with the words “the use of nicotine-containing products or the use of *hookahs*”’.

### Category 3

Eleven countries had WTS policies that fell into category 3. In the Czech Republic (Act No. 100/1997, amended 2016), they prohibit marketing of certain cigarettes, but not waterpipe: ‘The placing on the market of cigarettes with a characterising flavour and roll-your-own tobacco with a distinctive flavour is prohibited’.

### Category 4

#### Subcategory A

Six countries had WTS policies that fell into category 4A. In Syria, WT is mentioned in one of the articles related to the textual requirement for no smoking signs: ‘A symbol and a phrase denoting prohibition of smoking tobacco products, that is, cigarettes, water-pipes, cigars or tobacco-pipes, etc’.

#### Subcategory B

Seven countries had WTS policies that fell into category 4B. In Kenya, in the legislative supplement (No. 56) of 2007, a picture of a waterpipe appears randomly without any link to the policy and describes it as a smokeless tobacco product (figure 1).

#### WT policy regulations in relation to specific FCTC articles

We analysed the inclusion of WTS regulation related to nine specific FCTC articles (6, 8–11, 12/14, 15–16). Four countries (8%) included seven of the FCTC articles in their WTS policy. More specifically, over half of the countries included in our analysis regulated WT in relation to FCTC Articles 11 (n=26), 16 (n=25), 13 (n=23) and 8 (n=22). Less than 20% of the countries included in our analysis regulated WT in relation to Articles 6, 9, 10 (n=8) and 15 (n=2).

Table 3 lists the countries by FCTC article that it includes in its regulation related to WT.

**Table 3** Country categorisation by reference to FCTC articles specifically in relation to WT in their policies

Country (WHO region, WB categorisation)	FCTC articles addressed in relation to WT	Total number of articles addressed	Country (WHO region, WB categorisation)	FCTC articles that specifically address WT	Total number of articles addressed
Category 1			Category 3		
Azerbaijan (EUR, LIE)	8, 12/14, 13, 16	4	Bulgaria (EUR, UMIE)*	11	1
Chad (AFR, LIE)	11	1	Czech Republic (EUR, HIE)	10, 11, 12/14, 15	4
Costa Rica (AMR, UMIE)	8, 9, 10, 12/14, 16	5	England (EUR, HIE)	10, 11, 13, 15	4
Ecuador (AMR, UMIE)	8, 9, 10, 11, 13	5	Northern Ireland (EUR)	10, 11, 13	3
France (EUR, HIE)	10, 11, 13, 16	4	Poland (EUR, HIE)	11	1
India (SEAR, LMIE)	13	1	Portugal (EUR, HIE)	8, 9, 11, 12/14, 13, 16	6
Iraq (EMR, UMIE)*	8, 9, 11, 13, 16	5	Scotland (EUR)	10, 11, 13	3
KSA (Kingdom of Saudi Arabia) (EMR, HIE)	8, 10, 11, 12/14, 13, 16	6	Slovakia (EUR, HIE)	10, 11	2
Moldova (EUR, UMIE)*	8, 9, 10, 11, 12/14, 13, 16	7	Slovenia (EUR, HIE)	8, 10, 11, 12/14, 13, 16	6
Pakistan (EMR, LMIE)	6, 16	2	Sweden (EUR, HIE)	11	1
Panama (AMR, UMIE)	8, 10, 11, 12, 13	5	Wales (EUR)	10, 11, 13	3
Philippines (WPR, LMIE)	8, 11, 12/14, 13, 16	5	Category 4A		
Serbia (EUR, UMIE)	8, 12/14	2	Brazil (AMR, UMIE)	8, 11, 13	3
Vietnam (WPR, LMIE)*	6, 8, 9, 11, 12/14, 13, 16	7	Kenya (AFR, LMIE)	13, 16	2
Yemen (EMR, LIE)*	6, 8, 9, 11, 12/14, 13, 16	7	Niger (AFR, LIE)	16	1
Category 2			Rwanda (AFR, LIE)	8, 13, 16	3
Afghanistan (EMR, LIE)	6, 8, 11, 12/14, 13, 15, 16	7	Syria (EMR, LIE)*	8, 11, 12/14, 13, 16	5
Bahrain (EMR, HIE)	11	1	Thailand (SEAR, UMIE)*	16	1
Russia (EUR, UMIE)	6, 8, 10, 11, 13, 16	6	Category 4B		
Singapore (WPR, HIE)	13, 16	2	Estonia (EUR, HIE)	16	1
Turkey (EUR, UMIE)	6, 8, 11, 13, 16	5	Egypt (EMR, LMIE)*	6	1
UAE (United Arab Emirates) (EMR, HIE)	6, 8, 13, 16	4	Ireland (EUR, HIE)	11	1
			Nigeria (SEAR, LMIE)	11	1
			Norway (EUR, HIE)		0
			Uganda (SEAR, LIE)	13, 16	2
			Ukraine (EUR, LMIE)	8	1
			Uncategorised		
			Lebanon (EMR, UMIE)*	8, 11	2
			Mauritius (SEAR, UMIE)	16	1

Articles include the following: Article 6: price and tax measured to reduce demand for tobacco; Article 8: protection from exposure to tobacco smoke; Article 9: regulation of the contents of tobacco products; Article 10: regulation of tobacco product disclosure; Article 11: packaging and labelling of tobacco products; Article 12: education, communication, training and public awareness; Article 13: tobacco advertising, promotion and sponsorship; Article 14: demand reduction measures concerning tobacco dependence and cessation; Article 15: illicit trade in tobacco products; Article 16: sales to and by minors. We combined Articles 12 and 14 in this analysis.

\*Countries with state-owned tobacco companies.

AFR, African Region; AMR, Region of the Americas; EMR, East Mediterranean Region; EUR, European Region; FCTC, Framework Convention on Tobacco Control; HIE, high-income economy; LIE, low-income economy; LMIE, low middle-income economy; SEAR, South-East Asia Region; UMIE, upper middle-income economy; WB, World Bank; WPR, Western Pacific Region; WT, waterpipe tobacco.

## Association of country categorisation with extent of inclusion of WT regulation specific to FCTC articles

Country waterpipe policy categorisation seemed linked to the number of FCTC articles included in their policy: 75% of the countries (3 of 4) that included WT in relation to seven of the FCTC articles and only 22% of the countries (4 of 18) that included WT in relation to only one or two of the articles were ranked in category 1. Contrarily, 50% of the countries (9 of 18) that included WT in relation to one to two FCTC articles were ranked in category 4 (A or B), whereas only one of the countries in that category included WT in relation to more than three FCTC articles (table 3).

Notably, in relation to the potential for SOTC to influence the endgame, five of eight (62.5%) countries that have monopolies were in category 1, and 75% of the countries that included WT content related to seven of the FCTC articles are SOTC (table 3).

## Equity analysis of policies and prevalence data

For each equity axis of the PROGRESS framework, we provide examples of how it is referenced in country policies. We then include the number of countries that have prevalence data related to each equity axis and describe the findings. Table 4 lists which PROGRESS equity considerations are referenced in the policies of each country and includes prevalence data disaggregated by equity axis and country where available (we combined some of the data as noted in table 4).

### P: place of residence

Only a few countries (n=12, 25.5%) include reference to place of residence within the text of their policies. For example, in the United Arab Emirates, the law prohibits selling in proximity to residential buildings and districts. Prevalence data were extracted for five countries based on urban/rural indicators. Differences were not consistent, such that in India and the Philippines the reported rural prevalence of WTS was higher than in urban areas, whereas in Ukraine, Russia and Vietnam the reported urban WTS prevalence was higher than that in rural areas.

### R: race/ethnicity/culture/language

In this equity axis, language is the most noted factor in country WT policies, followed by race/ethnicity. Overall, thirteen countries (27.7%) include reference to this equity axis. Of these, twelve countries require educational materials or warnings to be in more than one language (including sign language). For example, in Nigeria, Rwanda and Uganda, notices are requested in English and at least one predominant local language. Race and ethnicity are referenced in the WT policy only in Costa Rica insofar as the law prohibits discrimination towards those seeking treatment for tobacco-related addictions. No WT prevalence data were found to be reported by race/ethnicity/culture/language in any of the countries that have WT policies.

### O: occupation

Workplaces were mentioned in 36 (76.6%) country WT policies as a location prohibiting WTS or requiring reduction of exposure to WT smoke. In addition, Afghanistan, Iraq, Kenya, Nigeria, Turkey, Vietnam and Yemen noted the need to respect tobacco farmers and other relevant professions and called for the creation and facilitation of opportunities to pursue different employment. Two countries—India and Vietnam—reported WTS prevalence by occupation. For example, in India, individuals who were retired or unemployed or had other occupations

reported a 0.77% WTS prevalence and 0.75% among those employed at any level.<sup>41</sup>

### G: gender/sex

Twelve countries (25.5%) mentioned gender in WT policies. In nine country policies, gender or sex is included mainly through reference to pregnant or puerperal women, or women of reproductive age. In addition, Afghanistan addresses gender by calling for a reduction in the production and importation of waterpipe sold to women, and Niger also calls for reinforcing measures to combat smoking among women. Terms used to identify gender or sex in the reports of prevalence data include ‘men’, ‘women’, ‘female’, ‘male’, ‘girls’ and ‘boys’. This equity indicator was the most reported on in the prevalence data, and all countries reporting prevalence data included a measure of gender or sex. Males, men and boys were more likely to have higher prevalence of WTS than females, women or girls. We noted that in Iraq<sup>42</sup> and Vietnam<sup>43</sup> the prevalence of WTS among men was collected, but not among women, which we consider an inequity in measurement.

### R: religion

Religion was noted in the WT policies of 15 countries (32%). For example, in Poland, government institutions are requested to work with organised religion associations to protect public health against the effects of tobacco use. In Brazil, the prohibition of WTS in public places excludes places of religious worship where rituals include the use of smoking (tobacco or non-tobacco) products. In Afghanistan, the law mentions the support of Islamic Shari’ah Law in banning waterpipe. None of the databases used collected information on WTS prevalence by any measure of religion.

### E: education

A majority of the countries with WT policies (n=37, 78.7%) reference education by calling for school curricula to include education on harm from tobacco and considering educational institutions as spaces to reduce exposure to tobacco harm or ban sales of tobacco products. ‘Students’ were also often mentioned in the policy in terms of addressing harms and reducing exposure and selling of tobacco to students. Five countries reported prevalence data by categories of education. In India, Vietnam and the Philippines, those with education at primary level or lower had higher prevalence of WTS than those with secondary or above education.

### S: socioeconomic status

Four country (0.09%) policies reference this equity measure. In Costa Rica, the law prohibits discrimination on the basis of socioeconomic status for those seeking treatment for tobacco-related addictions. Vietnam and Turkey note the need to support tobacco farmers/producers in disadvantaged areas to ensure an alternative livelihood. Only the Philippines reported WTS prevalence by socioeconomic status, with findings noting that lower wealth quintiles in rural areas had a higher prevalence of WTS than higher wealth quintiles in urban areas.

### S: social capital

Social capital was not specifically included in any of the WT country policies, but many countries’ (n=41, 87.2%) policies list locations where WTS is prohibited. Since many of these places are public spaces, they could be considered linked to social capital. Several laws also required the design of educational programmes

Table 4 Country WT policy category and prevalence of WTS by PROGRESS indicator

Country	Category of WTS policy	Number of articles that include WTS	PROGRESS equity axes addressed in the country policy	Equity axes data abstracted from data sources	Country	Category of WTS policy	Number of articles that include WTS	PROGRESS equity axes addressed in the country policy	Equity axes data abstracted from data sources
Afghanistan	2	8	Social capital, occupation, education, religion, gender.	No data available.	Pakistan	1	2	Social capital, education, occupation.	No data available.
Azerbaijan <sup>46</sup>	1	4	Social capital, place of residence, education, occupation.	Gender: Male: 4.80% Female: 24.60%	Kingdom of Saudi Arabia	1	6	Religion, education, occupation, social capital.	Gender: Male: 9.70% Female: 2.30% <sup>47</sup> Boys: 3.30% Girls: 1.60% <sup>48</sup>
Bahrain <sup>49</sup>	2	1	Social capital, occupation, education, religion.	Gender: Boys: 12.70% Girls: 5.80%	Panama <sup>50</sup>	1	5	Education, social capital, occupation, SES.	Gender: Boys: 2.50% Girls: 2.30%
Brazil	4A	3	Social capital, religion, occupation, education.	No data available.	Philippines <sup>51</sup>	1	5	Education, social capital.	Education: Primary school or less: 0.45% Secondary or above: 0.40% Place of residence: Urban: 0.20% Rural: 0.60% Wealth index quintile: Highest index quintile (urban): 0.30% Lowest index quintile (rural): 0.70% Gender: Male: 0.70% Female: 0.20% Boys: 4.30% Girls: 2.50% <sup>52</sup>
Bulgaria <sup>53</sup>	3	1	Social capital, education, occupation.	Gender: Boys: 17.20% Girls: 16.50%	Poland	3	1	Social capital, occupation, education, religion.	No data available.
Chad	1	1	Social capital, occupation, education, gender.	No data available.	Portugal	3	6	Social capital, occupation, education, place of residence, gender, race/ethnicity.	No data available.
Costa Rica <sup>54</sup>	1	5	Gender, social capital, occupation, education, religion, race, SES.	Gender: Boys: 6.00% Girls: 5.10%	Russia <sup>55</sup>	2	6	Social capital, education, occupation, place of residence.	Place of residence: Rural: 1.40% Urban: 3.20% Education: Primary school or less: 0.90% Secondary or above: 3.00% Gender: Male: 4.10% Female: 1.70% Boys: 7.90% Girls: 7.20% <sup>56</sup>
Czech Republic <sup>57</sup>	3	4		Gender: Boys: 10.40% Girls: 7.80%	Rwanda	4A	3	Race, religion, education, occupation, social capital.	No data available.
Ecuador	1	5	Social capital, occupation, education, place of residence.	No data available.	Scotland	3	3	Social capital.	No data available.
England	3	4		No data available.	Serbia <sup>58</sup>	1	2	Social capital, occupation, education.	Gender: Boys: 9.20% Girls: 8.70%

Continued



Table 4 Continued

Country	Category of WTS policy	Number of articles that include WTS	PROGRESS equity axes addressed in the country policy	Equity axes data abstracted from data sources	Country	Category of WTS policy	Number of articles that include WTS	PROGRESS equity axes addressed in the country policy	Equity axes data abstracted from data sources
Egypt	4B	1	Social capital.	<i>Gender:</i> Male: 8.70% Female: 0.10% <sup>59</sup> Boys: 8.50% Girls: 2.40% <sup>60</sup>	Singapore	2	2		No data available.
Estonia <sup>61</sup>	4B	1	Social capital, occupation, education, place of residence.	<i>Gender:</i> Boys: 6.47% Girls: 5.03%	Slovakia <sup>62</sup>	3	2	Social capital, race/language.	<i>Gender:</i> Boys: 8.40% Girls: 6.50%
France <sup>63</sup>	1	4	Social capital, occupation, education, place of residence.	<i>Gender:</i> Boys: 4.60% Girls: 4.00%	Slovenia	3	6	Social capital, education, occupation, race/language.	No data available.
India <sup>41</sup>	1	1	Social capital, occupation, education, place of residence, gender, race.	<i>Place of residence:</i> Rural: 0.90% Urban: 0.30% <i>Occupation:</i> Unemployed, elementary or other: 0.77% Employed at any level: 0.75% <i>Gender:</i> Men: 1.10% Women: 0.30% <i>Education:</i> Primary school or less: 0.83% Secondary or above: 0.40%	Sweden	3	1		No data available.
Iraq	1	5	Race/ethnicity, social capital, occupation, education, religion.	<i>Gender:</i> Male: 10.30% Female: N/A <sup>64</sup> Boys: 8.90% Girls: 6.00% <sup>42</sup>	Syria <sup>65</sup>	4A	5	Social capital, religion, education, occupation, gender, race/language.	<i>Gender:</i> Boys: 32.00% Girls: 18.00%
Ireland	4C	1		No data available.	Thailand <sup>66</sup>	4A	1	Social capital, occupation, education, gender, religion.	<i>Gender:</i> Boys: 4.70% Girls: 1.90%
Kenya	4A	2	Social capital, race, education, religion, occupation.	No data available.	Turkey	2	5	Occupation, social capital, education, gender, religion, race/ethnicity, SES.	No data available.
Lebanon	N/A	2	Social capital, occupation, education.	No data available.	United Arab Emirates <sup>67</sup>	2	4	Social capital, religion, education, occupation, place of residence, race/language.	<i>Gender:</i> Boys: 18.70% Girls: 7.60%
Mauritius	N/A	1	Social capital, education, occupation.	No data available.	Uganda <sup>68</sup>	4B	2	Social capital, religion, education, occupation, race.	<i>Gender:</i> Boys: 10.03% Girls: 9.27%
Moldova	1	7	Social capital, gender, occupation, education.	No data available.	Ukraine <sup>69</sup>	4B	1	Education, social capital, occupation, place of residence.	<i>Place of residence:</i> Urban: 0.90% Rural: 0.30% <i>Education:</i> Primary school or less: N/A Secondary or above: 0.50% <i>Gender:</i> Male: 1.30% Female: 0.30%

Continued

Table 4 Continued

Country	Category of WTS policy	Number of articles that include WTS	PROGRESS equity axes addressed in the country policy	Equity axes data abstracted from data sources	Country	Category of WTS policy	Number of articles that include WTS	PROGRESS equity axes addressed in the country policy	Equity axes data abstracted from data sources
Niger	4A	1	Social capital, occupation, education, gender.	No data available.	Vietnam <sup>43</sup>	1	7	Social capital, occupation, place of residence, gender, education, SES.	<i>Place of residence:</i> Urban: 0.20% Rural: 0.10% <i>Education:</i> Primary school or less: 0.20% Secondary or above: 0.10% <i>Occupation:</i> Unemployed, elementary or other: 0.15% Employed at any level: N/A <i>Gender:</i> Male 0.20% Female: N/A
Nigeria	4B	1	Social capital, occupation, education, gender, place of residence, race.	No data available.	Wales	3	3		No data available.
Northern Ireland	3	3	Social capital.	No data available.	Yemen <sup>70</sup>	1	7	Social capital, education, occupation, religion.	<i>Gender:</i> Boys: 12.40% Girls: 5.60%
Norway	3	0	Social capital, place of residence, occupation, education.	No data available.					

In the table, we report data from the databases only for current smokers who are 15 years of age or older for all indicators except for those referring to boys and girls, where the indicators report for current smokers younger than 15 years of age. Because of this manipulation, data are only reported for 23 countries, as opposed to 25 (Bulgaria only reported data for youth under the cut-off point of 15 years of age, such that place of residence is extracted for only five countries instead of 6; and Ecuador and Sweden reported data among adolescents including populations aged 15 and above, so that prevalence among boys and girls is extracted for 19 countries instead of 21). We dichotomised response options of the various equity indicators. For education, we used 'primary school or less' and 'secondary school or above.' For SES, we reported highest income quintile in urban populations and lowest income quintile among rural populations. For occupation, we reported those 'employed at any level' and those 'unemployed, [employed at] 'elementary' [level] or [holding] other (types of employment)'. For countries that reported on one or more types of shisha including 'traditional waterpipe' or 'waterpipe without tobacco', we chose the tobacco product most closely related to a shisha/hookah/waterpipe to ensure comparability across data. In the cases where there was more than one indicator reported for any given aggregated category, we decided to report a mean. Lastly, for countries where waterpipe tobacco smoking prevalence was reported over two or more data sets, we used the most recent report, complementing with data from other reports to fit the PROGRESS indicators where appropriate and where data were missing. As a result, from the reports that met the eligibility criteria in the prevalence data search, the table presents data from 18 out of 20 FCTC implementation reports, 6 out of the 6 GATS reports, 1 out of the 3 GYTS reports, 3 out of the 3 WHO STEPS reports and 0 out of the 1 DHS report.

Of the 47 countries with WT in their policies, only 25 reported at least one measure of WTS prevalence in any of the sources reviewed. These included the FCTC implementation reports (which included 20 countries), Global Adult Tobacco Survey (GATS) (6 countries), Global Youth Tobacco Survey (GYTS) (3 countries), WHO STEPS (STEPwise approach to surveillance) (3 countries) and Demographic and Health Surveys (DHS) (one country). The data reviewed dated from 2015 until March 2020.

FCTC, Framework Convention on Tobacco Control; PROGRESS, place of residence, race, occupation, gender, religion, education, socioeconomic status, social capital; SES, socioeconomic status; WT, waterpipe tobacco; WTS, waterpipe tobacco smoking.

and other awareness-raising exercises, as well as community support for those seeking help for quitting. Given that these can be interpreted as advocacy and community-oriented activities, we also considered them linked to social capital. Social capital was not reported across any prevalence data sets.

The comparison between equity indicators included in country policies with those included in prevalence data suggested a disconnect and lack of synergy between the goals of surveillance and those of policy development (table 4). Only 8 of 25 countries have at least one PROGRESS indicator consistent across policy and prevalence data.

## DISCUSSION

This paper has updated Jawad *et al*'s<sup>38</sup> scan of country WT control policies worldwide and enhanced the analysis by adding an equity lens. Jawad *et al*'s<sup>38</sup> paper identified 11 countries with WTS-related policies. We identified further 40 new WTS policies and excluded four countries from Jawad *et al*'s<sup>38</sup> based on our eligibility criteria. Hence we had a total of 47 countries with WTS-related policies. Our findings also

showed that since 2015 China, Iran, Syria and Uganda have updated their WTS policies. The Jawad *et al*'s<sup>38</sup> study reviewed policies in relation to Articles 8, 11 and 13 of the FCTC and we expanded the review to consider Articles 6 and 8–16. We also expanded our review to include equity in WTS-related policies as well as in WTS prevalence data.

Broadly, we continue to find very superficial policy attention to WT, despite its wide prevalence globally; only 45% of the countries are in categories 1 and 2, and only 8% include content related to WTS in relation to seven FCTC articles.

Interestingly, countries with SOTC seem to have potentially stronger/more specific WT policies; 75% of those that included content related to seven FCTC articles are SOTC, and 62% of these countries are classified as category 1 or 2, as opposed to 38% of countries without SOTC. Hogg *et al*'s<sup>21</sup> note that there is potential for 'partial interest alignment' between SOTC and endgame goals in relation to FCTC guidance for countries that encourage the government 'to impose a requirement (on SOTC) to consider social and environmental consequences and to take certain steps to address those consequences' (p370).

Smith *et al*<sup>22</sup> suggest that the merging of state-owned alcohol companies with SOTC could increase the coherence of policies across substances and advance endgame goals.

With respect to our equity analysis, there was no clear calling out of equity as a goal of WTS policies. To date, there has been no assessment of WTS policies in relation to their impact on equity, despite literature on the inequities resulting from broader tobacco control policies.<sup>19–22 24 25</sup> Cognisant of the dearth of data, we used a straightforward framework to limit complexity of analysis. The PROGRESS framework allows for the extension of analysis of prevalence data towards ‘social, behavioral, economic and environmental determinants’.<sup>26</sup> Yet, even with the simple PROGRESS analysis, we found very little data that allow a determination of the impact of WTS policies on equity. Further, we found a disconnect between the equity indicators included in a policy and the prevalence data collected, and neither seemed to inform the other. Surveillance is critical for policy evaluation, and at a minimum countries should synergise goals of policy and surveillance. However, more importantly, advancing equity considerations in WTS policy is critical to decreasing disparities and promoting justice. Dialogue is needed within the tobacco control community around the most appropriate equity framework for policy analysis and data collection.

We grouped countries into four categories. Although category 1 includes countries that clearly defined waterpipe as part of their tobacco product definition and thus, in principle, regulate it in other policy parts, in line with the FCTC articles, we cannot make conclusions as to the strength of those policies without looking more carefully at the nature of the regulation and the extent to which it addressed the uniqueness of WTS.<sup>11 12</sup> For example, although 73% of the countries in category 1 address Article 11, it is unclear if their guidance is tailored to WT. Category 2 may therefore be the preferred policy strategy. Convening an expert group to develop consensus around indicators of relevance, strength

and specificity in relation to WTS-specific policies would advance the field.

Several constraints to our methodology of analysis influence our results. For the policy analysis, we used the Tobacco-Free Kids website as our primary source. The English translations may not have been an accurate rendition of the original language. Also, we only included countries that explicitly used the word waterpipe or its related word/synonyms in their policies, which may have limited the validity of categorisation. Our analysis focused on the content of policies, and not on the form of their implementation.<sup>44</sup> For the prevalence data, our review of databases was not comprehensive, rather focused on potential comparability across countries. Data were very scarce, challenging comparability and preventing the assessment of policy impact.

Several recommendations arise from the comprehensive review of policies and prevalence data carried out for this paper. For the policy analysis, the complexity of developing WTS-specific policies and the implication of that complexity for other Alternative tobacco products (ATPs) highlight the challenge of developing and implementing tailored tobacco control policies. This is further confounded by the variety of stakeholders relevant to each ATP. Tobacco industry interference needs to continuously be assessed throughout this process. Moreover, countries considering the endgame strategy and working towards the 5% prevalence rate need to include WTS as one of the tobacco products to address more comprehensively. Regarding equity, we recommend that policies and surveillance centre equity as a goal in their policy documents. Policy and surveillance should be aligned on equity considerations. Further, a discussion is needed among global tobacco control advocates about the most relevant equity frameworks.

## CONCLUSION

The review in this manuscript provides a starting point for policy review and monitoring of FCTC implementation specific to WTS (and other ATPs)<sup>45</sup> and for a deeper consideration of the equity implications of WTS policies. The results provide data that researchers and advocates in those countries can use in their work to enhance policies, reduce WTS and promote equity. Future FCTC COP are advised to build on this current review and use information to push for stronger WTS-specific and equitable policies spanning the FCTC articles and to pressure countries that have particularly high prevalence rates to better address WTS.

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## What this paper adds

### What is already known on this subject

- ▶ The increase in waterpipe tobacco smoking (WTS) globally has been linked to a variety of factors, one of which is the lack of waterpipe-specific policies and regulations.
- ▶ A growing body of literature has documented the need for regulatory practices to control WTS.
- ▶ Previous global analysis of country tobacco control policies in 2015 indicated that very few country policies addressed WTS.

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

- ▶ Since 2015, there have been no updates on the progress of countries in addressing WTS in their legislation.
- ▶ Despite existing evidence of the potential of evidence-based tobacco control policies to increase health inequities, no one has looked at waterpipe tobacco control policies using a health equity lens.

### What this paper adds

- ▶ Globally, despite the growing acknowledgement of the importance of WTS policies, the number of countries that have regulations in place to address WTS comprehensively has not increased.
- ▶ Equity considerations do not seem to be influencing existing waterpipe tobacco control policies.

of the translations (including but not limited to local regulations, clinical guidelines, terminology, drug names and drug dosages), and is not responsible for any error and/or omissions arising from translation and adaptation or otherwise.

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