TobReg

Advisory Note

Waterpipe Tobacco Smoking: Health Effects, Research Needs and Recommended Actions by Regulators

WHO Study Group on
Tobacco Product Regulation
(TobReg)

World Health Organization

Tobacco Free Initiative

The World Health Organization (WHO) was established in 1948 as a specialized agency of the United Nations serving as the directing and coordinating authority for international health matters and public health. One of WHO's constitutional functions is to provide objective and reliable information and advice in the field of human health, a responsibility that it fulfils in part through its extensive programme of publications.

The Organization seeks through its publications to support national health strategies and address the most pressing public health concerns of populations around the world. To respond to the needs of Member States at all levels of development, WHO publishes practical manuals, handbooks and training material for specific categories of health workers; internationally applicable guidelines and standards; reviews and analyses of health policies, programmes and research; and state-of-the-art consensus reports that offer technical advice and recommendations for decision-makers. These books are closely tied to the Organization's priority activities, encompassing disease prevention and control, the development of equitable health systems based on primary health care, and health promotion for individuals and communities. Progress towards better health for all also demands the global dissemination and exchange of information that draws on the knowledge and experience of all WHO's Member countries and the collaboration of world leaders in public health and the biomedical sciences.

To ensure the widest possible availability of authoritative information and guidance on health matters, WHO secures the broad international distribution of its publications and encourages their translation and adaptation. By helping to promote and protect health and prevent and control disease throughout the world, WHO's books contribute to achieving the Organization's principal objective -- the attainment by all people of the highest possible level of health. In pursuit of this end, the Organization has vested the Director-General with the mandate to establish study groups to tackle scientific issues where WHO is expected to formulate policies to assist governments in formulating national regulations that have public health significance. The following advisory note is the result of the deliberations of one of the study groups so created, the WHO Study Group on Tobacco Product Regulation.

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Preface

Tobacco product regulation, which includes regulating the contents and emissions of tobacco products via testing, mandating the disclosure of the test results, and regulating the packaging and labelling of tobacco products, is one of the key pillars of any comprehensive tobacco control programme. The Contracting Parties to the World Health Organization Framework Convention on Tobacco Control (WHO FCTC), a binding international treaty, are bound, inter alia, by the Treaty's provisions concerning tobacco product regulation contained in its Articles 9, 10 and 11.

The sound scientific information provided by a WHO scientific advisory group on tobacco product regulation, established in 2000 specifically to fill the knowledge gaps that existed at the time in the area of tobacco product regulation, served as the basis for the negotiations and the subsequent consensus reached on the language of these three articles of the Convention.

In November 2003, in recognition of the critical importance of regulating tobacco products, the WHO Director-General formalized the ad hoc Scientific Advisory Committee on Tobacco Product Regulation (SACTob) by changing its status to that of a study group. Following the status change, the SACTob became the "WHO Study Group on Tobacco Product Regulation" (TobReg). It is composed of national and international scientific experts on product regulation, tobacco-dependence treatment, and the laboratory analysis of tobacco ingredients and emissions. Its work is based on cutting-edge research on tobacco product issues. It conducts research and proposes testing in order to fill regulatory gaps in tobacco control. As a formalized entity of WHO, TobReg reports to the WHO Executive Board through the Director-General in order to draw the Member States' attention to the Organization's efforts in tobacco product regulation.

This advisory note on Waterpipe tobacco smoking: health effects, research needs and recommended actions by regulators has been prepared by the WHO Study Group on Tobacco Product Regulation, in accordance with the prioritized work programme of the WHO Tobacco Free Initiative and with the provisions of the WHO FCTC concerning tobacco product regulation, in response to requests made by those Member States whose populations are exposed to this form of tobacco use. The Study Group approved and adopted the present advisory at its second meeting held in Rio de Janeiro, Brazil on 7 to 9 June 2005.

The Study Group's members serve without remuneration in their personal capacities rather than as representatives of governments or other bodies; their views do not necessarily reflect the decisions or the stated policy of WHO. The members' names are provided in the annex to this document.

Acknowledgements

The WHO Tobacco Free Initiative and the WHO Study Group on Tobacco Product Regulation wish to acknowledge the significant contributions made by Dr Alan Shihadeh (Lebanon) and Dr Thomas Eissenberg (United States of America). In early 2005, Drs Shihadeh and Eissenberg were commissioned by TFI to write a background paper on waterpipe tobacco smoking, including its prevalence, chemistry and toxicology, pharmacological effects and health hazards. As part of their effort to achieve in-depth research on the issues, Drs Shihadeh and Eissenberg collaborated with Dr Wasim Maziak of the Syrian Center for Tobacco Studies and investigators from the Egypt Smoking Prevention Research Initiative, namely Drs Ebenezer Israel (United States), Christopher Loffredo (United States) and Mostafa K. Mohamed (Egypt).

The results of the work commissioned by the WHO Tobacco Free Initiative served as the basis for discussion on the issue during the Second meeting of the WHO Study Group on Tobacco Product Regulation, held in Rio de Janeiro, Brazil in June 2005. This scientific advisory note is a direct product of the deliberations that took place at that meeting.

The WHO Tobacco Free Initiative and the WHO Study Group on Tobacco Product Regulation also wish to acknowledge the contributions made by Sara Hughes in the referencing and Ellen Joy Adriano and Dawn Mautner in the formatting and design preparation of the final document.

WHO Study Group on Tobacco Product Regulation

Advisory Note:

Waterpipe Tobacco Smoking: Health Effects, Research Needs and Recommended Actions by Regulators

Purpose of advisory

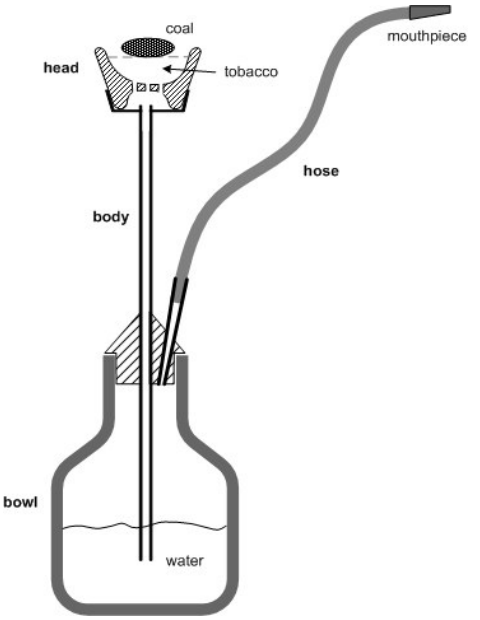
This advisory note, formulated by the WHO Study Group on Tobacco Product Regulation (TobReg), addresses the growing concerns about the increasing prevalence and potential health effects of tobacco smoking using waterpipes, also called "waterpipe tobacco smoking". The purposes of the advisory are to provide guidance to WHO and its Member States, to inform regulatory agencies in their efforts to implement the provisions of the WHO Framework Convention on Tobacco Control concerning education and communications, and to educate consumers about the risks of waterpipe smoking. The advisory also provides guidance to researchers and research agencies interested in facilitating a more thorough understanding of the health effects of tobacco waterpipe smoking, and to those engaged in developing tobacco smoking prevention and cessation programmes so that such programmes accommodate the unique aspects of waterpipe smoking.

Background and history

Waterpipes have been used to smoke tobacco and other substances by the indigenous peoples of Africa and Asia for at least four centuries (*1*). According to one historical account (*1*), a waterpipe was invented in India by a physician during the reign of Emperor Akbar (who ruled from 1556 to1605) as a purportedly less harmful method of tobacco use. The physician Hakim Abul Fath suggested that tobacco "smoke should be first passed through a small receptacle of water so that it would be rendered harmless" (*2*). Thus, a widespread but unsubstantiated belief held by many waterpipe users today – that the practice is relatively safe – is as old as the waterpipe itself (*3*). Marketing tools associated with waterpipes and waterpipe tobacco may reinforce this unsubstantiated belief (*4*). For example, the label of a popular waterpipe tobacco brand sold in South-West Asia and North America states "0.5% nicotine and 0% tar".

Description of waterpipes and waterpipe smoking

Generally, waterpipes have a head, body, water bowl, and hose (see figure). Holes in the bottom of the head allow smoke to pass into the body's central conduit. This conduit is submerged in the water that half-fills the water bowl. The hose is not submerged, exits from the water bowl's top, and ends with a mouthpiece, from which the smoker inhales. The tobacco that is placed into the head is very moist (and often sweetened and flavoured): it does not burn in a self-sustaining manner. Thus, charcoal is placed atop the tobacco-filled head (often separated from the tobacco by perforated aluminium foil) (*4*, *5*). When the head is loaded and the charcoal lit, a smoker inhales through the hose, creating a vacuum above the water, and drawing air through the body and over the tobacco and charcoal. Having passed over the charcoal, the heated air, which now also contains charcoal combustion products, passes through the tobacco, and the mainstream smoke aerosol is produced (*6*). The smoke passes through the waterpipe body, bubbles through the water in the bowl, and is carried through the hose to the smoker (*7*). During a smoking session, smokers typically replenish and adjust the charcoal periodically. A pile of lit charcoal may be kept in a nearby firebox for this purpose. As an alternative, smokers may opt for commercially available quick-lighting charcoal briquettes.



There are regional and/or cultural differences in some waterpipe design features, such as head or water bowl size, number of mouthpieces, etc., but all

waterpipes contain water through which smoke passes prior to reaching the smoker. Names for the waterpipe also differ, and include "narghile" in East Mediterranean countries including Turkey and Syria, "shisha" and "goza" in Egypt and some North African countries, and "hookah" in India (*8*).

Waterpipes can be purchased from dedicated supply shops, including Internet vendors, which also sell charcoal, tobacco and accessories. Waterpipes are now being marketed as portable, with the introduction of accessories such as carrying cases with shoulder straps. Some accessories are sold with claims to reduce the harmfulness of the smoke, such as mouthpieces that contain activated charcoal or cotton, chemical additives for the water bowl, and plastic mesh fittings to create smaller bubbles. None of these accessories have been demonstrated to reduce smokers' exposure to toxins or risk of tobacco-caused disease and death.

Health effects

Contrary to ancient lore and popular belief, the smoke that emerges from a waterpipe contains numerous toxicants known to cause lung cancer, heart disease, and other diseases (*4*). Waterpipe tobacco smoking delivers the addictive drug nicotine, and, as is the case with other tobacco products, more frequent use is associated with the smokers being more likely to report that they are addicted (*9*).

A waterpipe smoking session may expose the smoker to more smoke over a longer period of time than occurs when smoking a cigarette. Cigarette smokers typically take 8–12, 40–75 ml puffs over about 5–7 minutes and inhale 0.5 to 0.6 litres of smoke (*10*). In contrast, waterpipe smoking sessions typically last 20–80 minutes, during which the smoker may take 50–200 puffs which range from about 0.15 to 1 litre each (*6*). The waterpipe smoker may therefore inhale as much smoke during one session as a cigarette smoker would inhale consuming 100 or more cigarettes.

While the water does absorb some of the nicotine, waterpipe smokers can be exposed to a sufficient dose of this drug to cause addiction (*8*, *11*). Nicotine intake is an important regulator of tobacco intake in general, as evidenced by the fact that cigarette smokers tend to smoke until they get enough nicotine to satisfy their need and addiction, but not so much as to cause nausea (*12*, *13*). It is likely that the reduced concentration of nicotine in the waterpipe smoke may result in smokers inhaling higher amounts of smoke and thus exposing

themselves to higher levels of cancer-causing chemicals and hazardous gases such as carbon monoxide than if none of the nicotine was absorbed by the water; however, this issue needs further study (*4*, *14*, *15*). This puts waterpipe smokers and second-hand smokers at risk for the same kinds of diseases as are caused by cigarette smoking, including cancer, heart disease, respiratory disease, and adverse effects during pregnancy (*16*).

Regional and global patterns of waterpipe smoking

Waterpipe smoking is often social, and two or more people may share the same waterpipe (*3*, *6*). In South-West Asia and North Africa, it is not uncommon for children to smoke with their parents (*17*). If used in a commercial establishment such as a café or restaurant, the waterpipe is ordered (often from a menu of flavours) and an employee prepares it from an in-house stock (*8*).

Globally, the highest rates of smoking occur in the African Region (primarily North Africa), the Eastern Mediterranean Region and the South-East Asia Region (*6*). Since the 1990s waterpipe smoking appears to be spreading among new populations such as college students and young persons in the United States, Brazil and European countries. Waterpipe smoking appears to be stimulated by unfounded assumptions of relative safety compared to cigarettes, as well as the social nature of the activity (*18*). Commercial marketing, often with implicit or explicit safety-related claims, may also be contributing to the spread of waterpipe smoking across the globe. Waterpipe smokers may use waterpipes exclusively; however, many smokers may also smoke cigarettes. In some countries in which cigarette smoking is concentrated among men, waterpipe smoking appears more evenly distributed between both sexes (*8*, *19*). All these findings reinforce the need to conduct more research on waterpipes and the issues surrounding their use, and then to disseminate the information on the health risks to all countries.

Science base and conclusions

Waterpipe smoking has not been studied as intensively as has cigarette smoking; however, preliminary research on patterns of smoking, the chemistry of the smoke that is inhaled, and health effects supports the idea that waterpipe smoking is associated with many of the same risks as cigarette smoking, and may, in fact, involve some unique health risks. The science base supports the following conclusions:

1. Using a waterpipe to smoke tobacco poses a serious potential health hazard to smokers and others exposed to the smoke emitted (*9*).

2. Using a waterpipe to smoke tobacco is not a safe alternative to cigarette smoking (*4*).

3. A typical 1-hour long waterpipe smoking session involves inhaling 100–200 times the volume of smoke inhaled with a single cigarette (*6*).

4. Even after it has been passed through water, the smoke produced by a waterpipe contains high levels of toxic compounds, including carbon monoxide, heavy metals and cancer-causing chemicals (*8*, *14*).

5. Commonly used heat sources that are applied to burn the tobacco, such as wood cinders or charcoal, are likely to increase the health risks because when such fuels are combusted they produce their own toxicants, including high levels of carbon monoxide, metals and cancer-causing chemicals (*7*, *15*).

6. Pregnant women and the fetus are particularly vulnerable when exposed either actively or involuntarily to the waterpipe smoke toxicants (*16*).

7. Second-hand smoke from waterpipes is a mixture of tobacco smoke in addition to smoke from the fuel and therefore poses a serious risk for non-smokers (*8*).

8. There is no proof that any device or accessory can make waterpipe smoking safer.

9. Sharing a waterpipe mouthpiece poses a serious risk of transmission of communicable diseases, including tuberculosis and hepatitis (*4*).

10. Waterpipe tobacco is often sweetened and flavoured, making it very appealing; the sweet smell and taste of the smoke may explain why some people, particularly young people who otherwise would not use tobacco, begin to use waterpipes (*20*).

Research needs

There is surprisingly little research addressing tobacco smoking using a waterpipe, especially given that there are many millions of current waterpipe smokers and that waterpipe use is spreading across the globe. A more thorough understanding of waterpipe smoking, risks, and health effects requires worldwide efforts to study:

1. Types and patterns of smoking across regions and cultures.

2. National and global trends in waterpipe smoking.

3. How the chemical and physical properties of the smoke depend on the waterpipe set-up and smoking conditions (geometry of waterpipe, amount/type of coal and tobacco used, puffing behaviour, etc.).

4. Methods for evaluating toxicant yield, smoker exposure, and resultant absorption.

5. Patterns of smoking by individuals and how different smoking patterns relate to the smokers' intake of smoke toxicants, including nicotine, carcinogens, carbon monoxide, and other disease-causing compounds.

6. Relationships among yield, exposure, and absorption biomarkers.

7. Pharmacology and toxicology of smoke as assessed in laboratory tests using biological assays and in actual use by people.

8. Epidemiology of waterpipe-associated disease risk, including addiction and transmission of non-tobacco, communicable diseases.

9. The influence of cultural and social practices on initiation and maintenance.

10. The relationship between waterpipe smoking and other forms of tobacco, including substitution and multiple product smoking.

11. The relationship between waterpipe smoking and the use of other drugs, including marijuana.

12. Development of prevention and cessation strategies.

Suggested actions for regulators (consistent with the definition of "tobacco product" under the WHO Framework Convention on Tobacco Control)[1]

The WHO's Study Group on Tobacco Product Regulation (TobReg) urges consideration of the following public health initiatives to reduce waterpipe smoking and associated disease.

1. Waterpipes and waterpipe tobacco should be subjected to the same regulation as cigarettes and other tobacco products.

2. Waterpipes and waterpipe tobacco should include strong health warnings.

3. Claims of harm reduction and safety should be prohibited.

4. Misleading labelling, such as "contains 0 mg tar", which may imply safety should be prohibited.

5. Waterpipes should be included in comprehensive tobacco control efforts, including prevention strategies and cessation interventions.

6. Waterpipes should be prohibited in public places consistent with bans on cigarette and other forms of tobacco smoking.

7. Education of health professionals, regulators and the public at large is urgently needed about the risks of waterpipe smoking, including high potential levels of second-hand exposure among children, pregnant women, and others.

8. The TobReg recommends that a full document be produced in the WHO Technical Report Series to evaluate thoroughly the health effects of waterpipes and to develop recommendations.

[1] Article 1.f states that "tobacco products" mean products entirely or partly made of the leaf tobacco as raw materials which are manufactured to be used for smoking, sucking, chewing and snuffing.

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Annex

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