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Prevalence of Cigarette and Waterpipe Tobacco Smoking among Adults in Three Eastern Mediterranean Countries

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Title: Prevalence of Cigarette and Waterpipe Tobacco Smoking among Adults in Three Eastern Mediterranean Countries

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ABSTRACT

Objectives: Tobacco smoking is on the rise in the Eastern Mediterranean region. In light of limited surveillance of smoking in the region, this study sought to understand the prevalence of cigarette and waterpipe smoking among adults and the factors associated with smoking in Lebanon, Jordan, and Palestine.

Design, setting and participants: Household surveys were conducted in Lebanon (n=1680), Jordan (n=1925) and Palestine (n=1679). A multistage cluster sampling approach with probability-proportional-to-size random selection method was followed in the three countries

Primary and secondary outcome measures: Gender-specific prevalence rates and their 95% confidence intervals for cigarette and waterpipe smoking were estimated. Multivariable logistic regression was used to examine factors associated with current cigarette and waterpipe tobacco smoking.

Results: The prevalence of cigarette smoking among males/females respectively, was 48.6%/21.5% in Lebanon, 50.4%/9.1% in Jordan, and 53.4%/3.1% in Palestine. The prevalence of waterpipe smoking among males/females respectively was 32.7%/46.2% in Lebanon, 13.4%/7.8% in Jordan, and 18.0%/7.9% in Palestine. Cigarette smokers were more likely to be male, younger, and with lower educational attainment across the three countries. Waterpipe smokers were more likely to be young adults across the three countries. They were more likely to be male in Jordan and Palestine, and more likely to be female in Lebanon.

Conclusions: The high prevalence rates of smoking in Lebanon, Jordan, and Palestine are concerning. Continued surveillance is key to monitor smoking patterns and inform stronger tobacco control measures.

Keywords: cigarette smoking, waterpipe tobacco smoking, smoking prevalence, surveillance

Strengths and Limitations of the study:

- The study reports contemporary estimates of smoking prevalence using large, nationally representative surveys, that have been consistently lacking in previous studies.
- The study used standardized questionnaires across the three countries, allowing for valid cross-country comparisons.
- Tobacco use was self-reported and not biochemically verified and only a small number of females reported current smoking in Jordan and Palestine, which may have underreported prevalence.
- The study did not report on use of other alternative smoking products which are increasingly more available in the loosely regulated markets of those countries.

INTRODUCTION

Smoking is the leading cause of preventable death as well as a main risk factor for cancer, cardiovascular and pulmonary diseases[1]. Although considerable progress has been achieved in curbing the tobacco epidemic in many parts of the world, smoking trends continue to increase in low- and middle-income countries[2]. One notable example has been the Eastern Mediterranean region –which the World Health Organization (WHO) has projected the smoking prevalence to increase by 2025[2]. Cigarette smoking is highly prevalent in the Eastern Mediterranean region, due to weak regulatory environments, insufficient surveillance infrastructure and interference from a strong tobacco industry[3]. The problem is compounded by the wide prevalence of waterpipe tobacco smoking[4]. Waterpipe smoking rates in the region are considered the highest worldwide, with notably high prevalence among young adults[5]. This pattern is attributed to multiple factors, including the perception of waterpipe smoking as a less harmful alternative to cigarette smoking, the café culture encouraging social smoking of the waterpipe, and appeal of flavored waterpipe tobacco[6, 7].

The World Health Organization (WHO) Framework Convention on Tobacco Control requires parties to collect data on tobacco use and exposure on a regular basis to monitor smoking trends and policy implementation[1]. To date, surveillance of tobacco use among adults in the Eastern Mediterranean region has been limited. For example, routinely available data from the Global Adult Tobacco Survey (GATS) are only available in Egypt (2009)[8], Qatar (2013)[9] and Pakistan (2014)[10]. Other surveillance efforts in the region have been limited to specific populations, such as youth[11], university students[12, 13], and healthcare professionals [14]. These limitations in the available smoking prevalence data justify the need for detailed national prevalence data on both cigarette and waterpipe smoking among adults in Eastern Mediterranean countries.

In Lebanon, the most recent national estimates for adult cigarette smoking date back to 2013,[2] when the prevalence of current cigarette smoking was 34% among males and 19% among females. The national estimates for waterpipe tobacco smoking prevalence (25.3%) date back to 2009, when the prevalence rate was 26.5% among males and 24.3% among females[15]. In Jordan, according to STEPS 2019 survey, the prevalence of current smoking in Jordan is 41% (65.3% among men and 16.4% among women)[16]. As for Palestine, the most recent national estimates were from the Palestinian Family Survey in 2010, when the prevalence rate for cigarette smoking was 29.9% among adults (49.7% among men and 3.5% among women)[17].

Given that the most recent national prevalence estimates across the three countries date back to one decade, this study sought to estimate contemporary prevalence rates of current cigarette and waterpipe smoking in Lebanon, Jordan, and Palestine, and their correlates. Further, the issue of dual tobacco use has not been sufficiently explored in studies coming from the region, and as such, this study examined the dual use of cigarette and waterpipe tobacco in these three countries.

METHODS
Data source
We conducted nationally-representative in-person household surveys in Lebanon, Jordan, and Palestine between June and August 2019. Eligible respondents included males and females aged 18 years and older, residing in each of the countries as their primary place of residence,

regardless of nationality. We identified target sample sizes of 1,680 (50% female) for each country, based on sample size calculations to estimate the prevalence of current waterpipe tobacco smoking for adult males and females separately in each country, based on previously reported prevalence rates[2, 18]. A multistage cluster sampling approach with probability-proportional-to-size random selection method was followed. In each country, the sample of households was chosen in two stages. First, well-defined clusters were selected within each governorate (i.e., province). Second, housing units were selected within each selected cluster. The sampling frame for clusters was specific to the characteristics of each country. In Lebanon, all eight governorates were selected for sampling: Akkar, Baalbek-Hermel, Bekaa, Beirut, Mount Lebanon, Nabatieh, North Lebanon, and South Lebanon. In Jordan, all 12 governorates were included in the study: Ajloun, Amman, Aqaba, Balqa, Irbid, Jerash, Karak, Ma'an, Madaba, Mafraq, Tafilah, and Zarqa. In Palestine, all 11 governorates of the West Bank were selected: Bethlehem, East Jerusalem, Hebron, Jenin, Qalqilya, Nablus, Ramallah and Al-Bireh, Jericho, Salfit, Tubas, and Tulkarm. The Palestinian governorates in Gaza were excluded due to logistical barriers. The second stage of household selection involved choosing a random sample of 30 households from a complete list of households in a selected area, based on local administrative sources or household lists from the most recent census. One eligible male and one female resident were selected from each selected household. In Lebanon and Palestine, if an eligible female or male was not available for interview at the time of household visit, additional households were selected until an equal number of males and females was reached. In Jordan, additional households were selected that yielded a higher number of males than females. After eligibility screening, we provided potential respondents with information about the study and asked them to provide consent to participate. With the exception of aforementioned respondent selection, the same methods and recruitment protocol were used in all three countries.

Data collection
Data were collected using the same structured, Arabic-language questionnaire, with selected questions tailored to local context for each country. In the three countries, the surveys were administered face-to-face by trained interviewers. Data collectors in the three countries were trained on the ethics of data collection, consenting, sampling methodology and on the survey questions, using the same training manual. The training included a review of each questionnaire item, followed by practice sessions which involved role play as interviewer and interviewee which focused on probing to make sure all interviewees give full answers to ensure that there is no missing data for the analysis.

Measures
Respondents were asked if they had ever tried cigarettes or waterpipe tobacco. Among ever users of each product, respondents were asked if they were current users of the product. Current cigarette smoking was defined as currently smoking cigarettes every day or some days. Similarly, current waterpipe smoking was defined as currently smoking tobacco in a waterpipe every day or some days. Among current cigarette smokers, respondents were asked about the number of cigarettes smoked per day. Dual current smokers included both cigarette and waterpipe smokers while any current smoker included cigarette or waterpipe smokers. Among current waterpipe tobacco smokers, respondents were asked about the number of waterpipe sessions they smoked at home per week, the number of waterpipe sessions they smoked in a café per week, and whether they usually smoked flavored waterpipe tobacco. We assessed the

demographic characteristics of respondents, including their sex, age in years, marital status, educational attainment, and household monthly income.

Statistical analysis

Descriptive statistics were used to summarize the study participants' demographic and socio-economic characteristics. We estimated overall gender-specific prevalence rates of cigarette s and waterpipe smoking and their 95% confidence intervals (CI) within each country. Multivariable logistic regression analysis was conducted to examine factors associated with current cigarette smoking and current waterpipe smoking in separate models for each country. The independent variables tested in these models included gender (female vs. male), age group in years (18-29, 30-49, 50-64, and 65 or older), educational attainment (primary school or less, middle school, high school/diploma, and university), marital status (ever married vs. never married) and individual monthly income (quartiles within each country). Odds ratios (ORs) and their 95% CIs were estimated from the models. A p-value of less than 0.05 was considered statistically significant. Respondents with missing data on outcome measures or covariates were excluded from models on a case-wise basis. Data were analyzed using Stata statistical software version 16 (StataCorp, College Station, TX).

Patient and Public Involvement

It was not appropriate or possible to involve patients or the public in the design, or conduct, or reporting, or dissemination plans of our research

RESULTS

Table 1 presents the characteristics of respondents by gender in each country. A total of 1,680 respondents in Lebanon, 1,925 in Jordan, and 1,679 in Palestine completed the surveys. Females represented 50.0% of the sample in Lebanon, 44.6% in Jordan and 50.0% in Palestine. In terms of age composition, 45.1% of respondents in Lebanon, 45.9% of respondents in Jordan, and 41.3% of respondents in the Palestine were younger than 50 years old. In terms of marital status, 80.8% of respondents in Lebanon, 75% of respondents in Jordan and 81.5% of respondents in Palestine were ever married. In terms of education, 20.7% of respondents in Lebanon, 25.1 % in Jordan, and 16.2 % in Palestine completed university education.

Table 1. Socio-demographic characteristics by gender and country

Variable	Lebanon		Jordan		Palestine	
	Male (n=840)	Female (n=840)	Male (n=1067)	Female (n=858)	Male (n=839)	Female (n=840)
	(%) n	(%) n	(%) n	(%) n	(%) n	(%) n
Age, in years						
18 – 29	(22.7) 191	(29.3) 246	(26.4) 282	(27.7) 238	(32.9) 276	(25.7) 216
30 – 49	(44.5) 374	(45.7) 384	(45.2) 482	(46.6) 400	(37.8) 317	(44.8) 376
50 – 64	(28.3) 238	(23.2) 195	(19.9) 212	(18.9) 162	(25.4) 213	(28.6) 240
≥65	(4.4) 37	(1.8) 15	(8.5) 91	(6.8) 58	(3.9) 33	(1.0) 8

Marital Status						
Never married	(20.4) 170	(18.1) 153	(25.0) 210	(12.1) 102	(22.1) 185	(8.2) 69
Ever married	(79.8) 670	(81.8) 687	(75.0) 629	(75.0) 738	(75.0) 629	(87.9) 738
Education						
Primary school or less	(17.4)146	(11.9) 100	(22.3) 238	(24.0) 206	(44.3) 372	(50.4) 423
Middle school	(21.7) 182	(21.3) 179	(41.1) 439	(36.6) 314	(33.7) 283	(25.8) 217
High school/diploma	(40.0) 336	(46.4) 390	(12.0) 128	(13.9) 119	(7.5) 63	(5.9) 50
University	(21.0) 176	(20.4) 171	(24.6) 262	(25.5) 219	(14.4) 121	(17.9) 150
Monthly Income*						
Quartile 1	(7.51) 62	(9.1) 75	(21.7) 227	(24.9) 207	(21.2) 174	(26.6) 214
Quartile 2	(39.5) 326	(38.8) 321	(39.4) 411	(38.5) 320	(41.9) 344	(44.0) 355
Quartile 3	(39.1) 323	(38.7) 320	(25.1) 262	(23.7) 197	(19.8) 163	(16.5) 133
Quartile 4	(13.9) 115	(13.4) 111	(13.8) 144	(12.9) 107	(17.0) 140	(12.9) 104
No income	(1.7) 14	(1.6) 13	(2.2) 23	(3.2) 27	(2.2) 18	(4.0) 34

*Income quartile levels: **Lebanon:** [1] <$529.88; [2] $529.88 - < $993.53; [3] $993.53 - < $1,987.05; [4] ≥ $1,987.05. **Jordan:** [1] < $423.13; [2] $423.13 = < $705.22; [3] $705.22 - < $1,269.39. **Palestine:** [1] < $610.04; $610.04 - < $1,067.57; [3] $1,067.57 - < $1,525.10; [4] ≥ 1,525.10.

Prevalence of cigarette and waterpipe tobacco smoking

Figure 1 shows the overall and gender-specific prevalence of current cigarette smoking, waterpipe smoking, dual smoking and any smoking, by country. Overall, the prevalence rate (95% CI) for current cigarette smoking was 35.1% (32.8, 37.3) in Lebanon, 32.0% (29.9, 34.1) in Jordan, and 28.2% (26.1, 30.5). The prevalence rate for current waterpipe smoking was 39.5% (37.1, 41.8) in Lebanon, 11.0% (9.6, 12.4) in Jordan, and 12.9% (11.4, 14.6) in Palestine. The overall rate for dual current smoking was 3.6% (2.8, 4.6) in Lebanon, 2.8% (2.1, 3.6) in Jordan, and 4.4% (3.5, 5.5) in Palestine. As for any current smoking, the prevalence rate was 70.9% (68.7, 73.1) in Lebanon, 40.2% (38.0, 42.4) in Jordan, and 36.7% (34.4, 39.1) in Palestine.

Patterns of cigarette and waterpipe smoking

Table 2 presents the patterns of cigarette and waterpipe smoking among current smokers according to gender and country. In Lebanon, almost half of current cigarette smokers reported smoking ≥20 cigarettes per day (42.6% of males and 51.9% of females). In Jordan, more than half of male current cigarette smokers (52.0%) and one third of female cigarette smokers (33.3%) reported smoking ≥20 cigarettes per day. In Palestine, among those who currently smoke cigarettes, 37.5% of males and 3.8% of females reported smoking ≥20 cigarettes per day.

The majority of waterpipe smokers in Lebanon used flavored tobacco (86.2% of males and 89.2% of females), smoked more than 3 sessions at home (92.5% of males and 86.9% of females) and smoked three sessions or less per week in a café (90.0% of males and 96.3% of females). In Jordan, the majority of waterpipe smokers used flavored tobacco (92.3% of males and 98.5% of females), the majority of male respondents (70.5%) and less than half of females (46.9%) smoked more than three waterpipe sessions at home, and the majority of respondents smoked three sessions or less per week in a café (62.9% of males and 85.7% of females). In Palestine, the majority of waterpipe smokers used flavored tobacco (94.6% of males and 93.9%

of females), the majority of respondents (85.7% of males and 95.4% of females) smoked more than 3 sessions of waterpipe at home, and the majority of respondents smoked three sessions or less per week in a café (97.7% of males and 95.5% of females).

Table 2. Patterns of cigarette and waterpipe smoking among current smokers according to gender by country

Variable	Lebanon		Jordan		Palestine	
	Males	**Females**	**Males**	**Females**	**Males**	**Females**
	(%) n	**(%) n**	**(%) n**	**(%) n**	**(%) n**	**(%) n**
Cigarettes per day						
<10	(35.0) 143	(34.8) 63	(3.4) 18	(18.0) 14	(9.4) 42	(23.1) 6
10 – 20	(42.6) 174	(51.9) 94	(44.6) 240	(48.7) 38	(53.1) 238	(73.1) 19
>20	(22.3) 91	(13.3) 24	(52.0) 280	(33.3) 26	(37.5) 168	(3.8) 1
Total	(100.0) 408	(100.0) 181	(100.0) 538	(100.0) 78	(100.0) 448	(100.0) 26
Waterpipe sessions at home, per week						
≤3	(7.5) 19	(13.1) 49	(29.5) 33	(53.1) 34	(85.7) 108	(95.4) 62
>3	(92.5) 234	(86.9) 326	(70.5) 79	(46.9) 30	(14.3) 18	(4.6) 3
Waterpipe sessions at café, per week						
≤3	(90.9) 180	(96.3) 236	(62.9) 22	(85.7) 6	(97.7) 85	(95.5) 21
>3	(9.1) 18	(3.7) 9	(37.1) 13	(14.3) 1	(2.3) 2	(4.5) 1
Type of waterpipe tobacco smoked						
Flavored	(86.2) 237	(89.2) 346	(92.3) 132	(98.5) 66	(94.6) 141	(93.9) 62
Non-flavored	(13.8) 38	(10.8) 42	(7.7) 11	(1.5) 1	(5.4) 8	(6.1) 4

Factors associated with current cigarette smoking

Table 3 presents the results of the multivariable analysis of factors associated with current cigarette smoking by country. In Lebanon, males were more likely than females to be current cigarette smokers (OR: 5.07; 95% CI: 3.73, 6.89). Compared with young adults 18-29 years old, respondents who were older were more likely to be current smokers: (5.52; 3.22, 9.49) among those 30-49 years old, (6.34; 3.57, 11.26) among adults 50-64 years old, and (2.84; 1.15, 7.05) among adults ≥65 years old. Compared with adults who had a primary school education or less, adults with a high school education (0.44; 0.27, 0.72) and those with a university education (0.52; 0.29, 0.92) were significantly less likely to be current cigarette smokers.

In Jordan, males were significantly more likely than females to be current cigarette smokers (13.77; 9.29, 20.44). Adults ≥65 years old were less likely than those 18-29 years old to be current cigarette smokers (0.35; 0.19, 0.65). Compared with adults who had a primary school education or less, adults with a high school education (0.61; 0.38, 0.97) and those with a university education (0.61; 0.41, 0.91) were less likely to be current cigarette smokers. In addition, adults in the highest income quartile were significantly more likely to be current smokers compared with adults in the lowest income quartile (1.68; 1.05, 2.69).

Finally, in Palestine, males were also significantly more likely than females to be current cigarette smokers (66.95; 29.28, 153.10). Adults ≥65 years old were less likely than those 18-29 years old to be cigarette smokers (0.33; 0.12, 0.88). Compared to adults with a primary school education or less, adults with a middle school education (0.58; 0.39, 0.84) and those with a university education (0.57; 0.35, 0.93) were significantly less likely to be current cigarette smokers.

Table 3. Multivariable analysis of factors associated with current cigarette smoking among adults by country

Variable	Lebanon		Jordan		Palestine	
	OR (95% CI)	p	OR (95% CI)	p	OR (95% CI)	p
Gender						
Female	reference		reference		reference	
Male	5.07 (3.73, 6.89)	<0.001	13.77 (9.29, 20.44)	<0.001	66.95 (29.28, 153.10)	<0.001
Age, in years						
18 – 29	reference		reference		reference	
30 – 49	5.52 (3.22, 9.49)	<0.001	1.06 (0.77, 1.54)	0.76	1.43 (0.89, 2.27)	0.13
50 – 64	6.34 (3.57, 11.26)	<0.001	0.89 (0.57, 1.37)	0.59	1.64 (0.38, 1.05)	0.08
≥65	2.84 (1.15, 7.05)	0.024	0.35 (0.19, 0.65)	0.001	0.33 (0.12, 0.88)	0.03
Education						
Primary school or less	reference		reference		reference	
Middle school	0.94 (0.58, 1.52)	0.79	0.83 (0.59, 1.17)	0.31	0.58 (0.39, 0.84)	<0.001
High school/diploma	0.44 (0.27, 0.72)	0.001	0.61 (0.38, 0.97)	0.04	0.68 (0.37, 1.26)	0.22
University	0.52 (0.29, 0.92)	0.02	0.61 (0.41, 0.91)	0.02	0.57 (0.35, 0.93)	0.03
Marital Status						
Not Married	reference		reference		reference	
Married	0.61 (0.36, 1.02)	0.06	1.18 (0.83, 1.67)	0.35	1.12 (0.69, 1.80)	0.64
Monthly Income*						
Quartile 1	reference		reference		reference	
Quartile 2	1.09 (0.60, 2.01)	0.77	1.42 (1.00, 2.03)	0.05	0.83 (0.54,1.26)	0.37
Quartile 3	1.06 (0.56, 2.00)	0.87	1.46 (0.99, 2.15)	0.06	1.17 (0.71, 1.93)	0.54
Quartile 4	1.61 (0.76, 3.40)	0.21	1.68 (1.05, 2.69)	0.03	0.62 (0.36, 1.06)	0.08
No income	1.54 (0.44, 5.40)	0.50	0.98 (0.41, 2.36)	0.96	0.37 (0.12, 1.21)	0.10

*Income quartile levels: **Lebanon:** [1] <$529.88; [2] $529.88 - < $993.53; [3] $993.53 - < $1,987.05; [4] ≥ $1,987.05. **Jordan:** [1] < $423.13; [2] $423.13 = < $705.22; [3] $705.22 - < $1,269.39. **Palestine:** [1] < $610.04; $610.04 - < $1,067.57; [3] $1,067.57 - < $1,525.10; [4] ≥ 1,525.10.

Factors associated with current waterpipe tobacco smoking
Table 4 presents the results of multivariable analysis of factors associated with current waterpipe tobacco smoking by country. In Lebanon, males were less likely than females to be current waterpipe smokers (0.49; 0.37, 0.64). Also, adults older than 18-29 years old were less likely to be current waterpipe smokers: (0.30; 0.18, 0.49) among 30-49 years old, (0.08; 0.04, 0.15) among 50-64 years old, and (0.03; 0.01, 0.14). Compared to adults with a primary school education or less, adults with a high school education were more likely to be waterpipe smokers (1.87; 1.05, 3.34). Compared with adults in the lowest income quartile, those in the second (2.50; 1.19, 5.26) and third (2.45; 1.13, 5.30) quartiles were more likely to be current waterpipe smokers.

In Jordan, males were more likely than females to be current waterpipe smokers (1.92; 1.40, 2.62). Compared with adults 18-29 years old, older adults were less likely to be waterpipe smokers: (0.66; 0.44, 0.99) among those 30-49 years old, (0.45; 0.27, 0.75) among those 50-64 years old, and (0.07; 0.02, 0.31) among those ≥65 years old.

Similarly, in Palestine, males were more likely than females to be current waterpipe smokers (2.69; 1.85, 3.92). Compared with adults 18-29 years old, older adults were less likely to be waterpipe smokers: (0.48; 0.30, 0.77) among adults 30-49 years old, (0.19; 0.09, 0.35) among adults 50-64 years old, and (0.19; 0.05, 0.77) among adults ≥65 years old.

Table 4. Multivariable analysis of factors associated with current waterpipe smoking among adults by country

Variable	Lebanon		Jordan		Palestine	
	OR (95% CI)	p	OR (95% CI)	p	OR (95% CI)	p
Gender						
Female	reference		reference		reference	
Male	0.49 (0.37, 0.64)	<0.001	1.92 (1.40, 2.62)	<0.001	2.69 (1.85, 3.92)	<0.001
Age, in years						
18 – 29	reference		reference		reference	
30 – 49	0.30 (0.18, 0.49)	<0.001	0.66 (0.44, 0.99)	0.04	0.48 (0.30, 0.77)	0.002
50 – 64	0.08 (0.04, 0.15)	<0.001	0.45 (0.27, 0.75)	0.02	0.19 (0.09, 0.35)	<0.001
≥65	0.03 (0.01, 0.14)	<0.001	0.07 (0.02, 0.31)	<0.001	0.19 (0.05, 0.77)	0.02
Education						
Primary school or less	reference		reference		reference	
Middle school	1.03 (0.58, 1.86)	0.91	1.34 (0.87, 2.08)	0.18	1.37 (0.90, 2.10)	0.14
High school/diploma	1.87 (1.05, 3.34)	0.03	1.14 (0.64, 2.02)	0.65	1.72 (0.84, 3.51)	0.14
University	1.90 (0.98, 3.69)	0.06	1.19 (0.73, 1.95)	0.47	1.26 (0.75, 2.13)	0.39
Marital Status						
Not Married	reference		reference		reference	
Married	1.54 (0.91, 2.63)	0.11	1.06 (0.71, 1.58)	0.76	0.66 (0.41, 1.06)	0.08
Monthly Income*						
Quartile 1	reference		reference		reference	
Quartile 2	2.50 (1.19, 5.26)	0.02	0.75 (0.49, 1.14)	0.18	0.71 (0.43, 1.18)	0.18
Quartile 3	2.45 (1.13, 5.30)	0.02	1.05 (0.67, 1.66)	0.82	0.89 (0.49, 1.61)	0.50
Quartile 4	1.93 (0.79, 4.74)	0.15	1.44 (0.87, 2.37)	0.16	1.20 (0.66, 2.20)	0.66
No income	1.27 (0.28, 5.84)	0.76	1.01 (0.37, 2.75)	0.98	0.72 (0.22, 2.37)	0.22

*Income quartile levels: **Lebanon:** [1] <$529.88; [2] $529.88 - < $993.53; [3] $993.53 - < $1,987.05; [4] ≥ $1,987.05. **Jordan:** [1] < $423.13; [2] $423.13 = < $705.22; [3] $705.22 - < $1,269.39. **Palestine:** [1] < $610.04; $610.04 - < $1,067.57; [3] $1,067.57 - < $1,525.10; [4] ≥ 1,525.10.

DISCUSSION

This study provides contemporary estimates of the prevalence and patterns of cigarette and waterpipe smoking among adults in Lebanon, Jordan and Palestine using nationally representative surveys. Findings from the study raise renewed concerns over tobacco use in these countries, which have some of the highest smoking prevalence rates globally: more than two in three adults in Lebanon are current smokers of combustible tobacco products, and almost two-thirds of adult males in Jordan and Palestine are also current smokers. Generally, males were more likely to be current smokers than females. However, almost half of adult females were current waterpipe smokers in Lebanon, exceeding by 40% the prevalence among adult males in that country.

Our study showed comparable results to previously reported prevalence estimates of cigarette smoking in Lebanon,[19] with significantly higher estimates in males than females, yet a higher prevalence for waterpipe smoking particularly in females, which may be partially explained by the fact that waterpipe smoking is becoming a socially normative behavior, and it is unregulated, widely available and affordable in Lebanon[20]. In Jordan, our results were comparable to previously reported estimates from the 2019 STEP[16]. In Palestine, adult prevalence estimates among males were markedly higher than previously reported estimates[18, 21].

The gender- and age-specific prevalence rates of cigarette and waterpipe tobacco smoking are generally consistent with previous findings in the three countries[3]. Females in Lebanon had the highest prevalence of waterpipe smoking whereas males in Palestine had the highest prevalence of cigarette smoking across the three countries. Young adults across all three countries were more likely to smoke waterpipe tobacco. This may be attributable to the fact that waterpipe smoking is considered more socially acceptable and is widely perceived to be less harmful than cigarette smoking among young people[6].

Patterns of smoking were different among current cigarette smokers across the three countries. More than one-third of males and females in Lebanon were light smokers, averaging less than ten cigarettes per day. In contrast, only 3.4% of males and 18.0% of females who were current cigarette smokers in Jordan were light smokers. Similarly, in Palestine, 9.4% of males and 23.1% of females were light smokers. These patterns, combined with the high overall prevalence rates of cigarette smoking, may be suggestive that for a significant proportion of smokers, cigarette smoking may be a social behavior, especially in Lebanon. Alternatively, almost all male smokers in Jordan were heavy smokers, suggesting higher levels of addiction, with relevant implications for smoking cessation programs.

As for waterpipe smoking patterns, the vast majority of current smokers in Lebanon reported smoking more than three sessions weekly at home, and three sessions or less in cafés. This pattern was similar among males in Jordan. However, a majority of female smokers reported three sessions or less weekly regardless of the setting. This pattern was also reflected among males and females in Palestine. Across all three countries, the overwhelmingly majority of current waterpipe smokers use flavored tobacco. This pattern may be attributed to increased availability of flavored tobacco products, affordability, their unregulated marketing, as well as poor and often misleading labeling of waterpipe tobacco products[5]. Previous research reported

that smokers using flavored waterpipe tobacco experience more satisfaction, joy and calmness following the smoking session[22].

Strengths of this study include the fact that it reports contemporary estimates of smoking prevalence using large, nationally representative surveys, that have been consistently lacking in previous studies. The study used standardized questionnaires across the three countries, allowing for valid cross-country comparisons. Study limitations include the fact that tobacco use was self-reported and not biochemically verified, which may underreport prevalence. In addition, only a small number of females reported current smoking in Jordan and Palestine. These small sample sizes may have resulted in unreliable estimates of the detailed patterns of cigarette and waterpipe smoking reported for females in the two countries. The study also did not report on use of other alternative smoking products such as electronic cigarettes[16, 23], heated tobacco, and midwakh [24, 25], which are increasingly more available in the loosely regulated markets of those countries.

CONCLUSION

The alarmingly high prevalence of tobacco smoking in Lebanon, Jordan, and Palestine highlights the immediate need for strengthening existing tobacco control policies, especially those that curb waterpipe tobacco smoking. A starting point would be to regularly monitor tobacco trends at the national level using surveillance data such as the ones reported in this study. Findings from this research provide policy makers with evidence that can help in pushing forward implementation and enforcement of more effective and tailored tobacco control measures
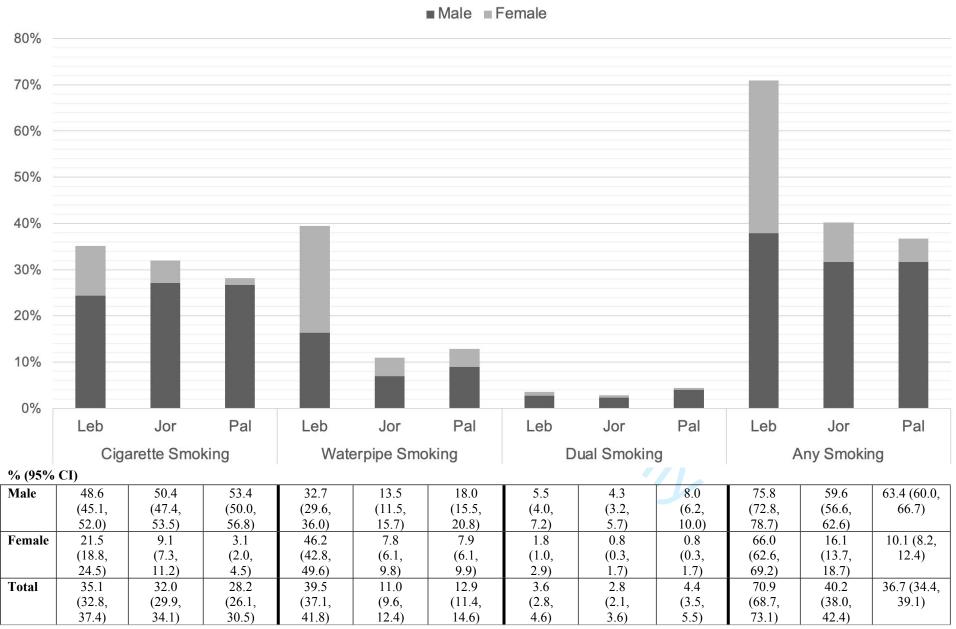
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Figure 1. Overall and gender specific prevalence of current cigarette smoking, waterpipe smoking, dual smoking, and any smoking by country

■ Male ■ Female

% (95% CI)												
Male	48.6 (45.1, 52.0)	50.4 (47.4, 53.5)	53.4 (50.0, 56.8)	32.7 (29.6, 36.0)	13.5 (11.5, 15.7)	18.0 (15.5, 20.8)	5.5 (4.0, 7.2)	4.3 (3.2, 5.7)	8.0 (6.2, 10.0)	75.8 (72.8, 78.7)	59.6 (56.6, 62.6)	63.4 (60.0, 66.7)
Female	21.5 (18.8, 24.5)	9.1 (7.3, 11.2)	3.1 (2.0, 4.5)	46.2 (42.8, 49.6)	7.8 (6.1, 9.8)	7.9 (6.1, 9.9)	1.8 (1.0, 2.9)	0.8 (0.3, 1.7)	0.8 (0.3, 1.7)	66.0 (62.6, 69.2)	16.1 (13.7, 18.7)	10.1 (8.2, 12.4)
Total	35.1 (32.8, 37.4)	32.0 (29.9, 34.1)	28.2 (26.1, 30.5)	39.5 (37.1, 41.8)	11.0 (9.6, 12.4)	12.9 (11.4, 14.6)	3.6 (2.8, 4.6)	2.8 (2.1, 3.6)	4.4 (3.5, 5.5)	70.9 (68.7, 73.1)	40.2 (38.0, 42.4)	36.7 (34.4, 39.1)

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STROBE Statement—Checklist of items that should be included in reports of *cross-sectional studies*

	!"#$&'	**(#)'$$#*+,"-'**	**.,/#&'**
0-"l#,*+,23"4,)"	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
!*"4'+5)"-'*			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	3
Objectives	3	State specific objectives, including any prespecified hypotheses	4
6#"7'+3			
Study design	4	Present key elements of study design early in the paper	4
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	4
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	4
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	5
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	*5*
Bias	9	Describe any efforts to address potential sources of bias	5
Study size	10	Explain how the study size was arrived at	4
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	5
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	5
		(*b*) Describe any methods used to examine subgroups and interactions	5
		(*c*) Explain how missing data were addressed	5
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	5
		(*e*) Describe any sensitivity analyses	5
(#351"3			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	4
		(b) Give reasons for non-participation at each stage	
		(c) Consider use of a flow diagram	

Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	5 – 6
		(b) Indicate number of participants with missing data for each variable of interest	
Outcome data	15*	Report numbers of outcome events or summary measures	6-12
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	6-12
		(*b*) Report category boundaries when continuous variables were categorized	p.6 (table 1), p.8 (table 2), p.10 (table 3), p.12 (table 4)
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	p.6 (table 1), p.8 (table 2),

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Key results	18	Summarise key results with reference to study objectives	13
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	14
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	13
Generalisability	21	Discuss the generalisability (external validity) of the study results	13

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Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	15

*Give information separately for exposed and unexposed groups.

&'"#; An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

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Title: Prevalence of Cigarette and Waterpipe Tobacco Smoking among Adults in Three Eastern Mediterranean Countries: A cross-sectional household survey

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Title: Prevalence of Cigarette and Waterpipe Tobacco Smoking among Adults in Three Eastern Mediterranean Countries: A cross-sectional household survey

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ABSTRACT

Objectives: Tobacco smoking is on the rise in the Eastern Mediterranean region. In light of limited surveillance of smoking in the region, this study sought to understand the prevalence of cigarette and waterpipe smoking among adults and the factors associated with smoking in Lebanon, Jordan, and the West Bank.

Design, setting and participants: Household surveys were conducted with participants over the age of 18 in Lebanon (n=1680), Jordan (n=1925) and the West Bank (n=1679) between June and August 2019. A multistage cluster sampling approach with probability-proportional-to-size random selection method was followed in the three countries.

Primary and secondary outcome measures: Gender-specific prevalence rates and their 95% confidence intervals for cigarette and waterpipe smoking were estimated. Multivariable logistic regression was used to examine factors associated with current cigarette and waterpipe tobacco smoking.

Results: The prevalence of cigarette smoking among males and females respectively was 48.6% and 21.5% in Lebanon, 50.4% and 9.1% in Jordan, and 53.4% and 3.1% in the West Bank. The prevalence of waterpipe smoking among males and females respectively was 32.7%and 46.2% in Lebanon, 13.4% and 7.8% in Jordan, and 18.0% and 7.9% in the West Bank. Cigarette smokers were significantly ($p<0.05$) more likely to be male, younger, and with lower educational attainment across the three countries. Waterpipe smokers were more likely to be young adults across the three countries ($p<0.001$). They were more likely to be male in Jordan and the West Bank, and more likely to be female in Lebanon.

Conclusions: The high prevalence rates of smoking in Lebanon, Jordan, and the West Bank are concerning. Continued surveillance is key to monitor smoking patterns and inform stronger tobacco control measures.

Keywords: cigarette smoking, waterpipe tobacco smoking, smoking prevalence, surveillance

Strengths and Limitations of the study:

- The study reports contemporary estimates of smoking prevalence using large, nationally representative surveys, that have been consistently lacking in previous studies.
- The study used standardized questionnaires across the three countries, allowing for valid cross-country comparisons.
- Tobacco use was self-reported and not biochemically verified and only a small number of females reported current smoking in Jordan and the West Bank, which may have underreported prevalence.
- The study did not report on use of other alternative smoking products which are increasingly more available in the loosely regulated markets of those countries.

INTRODUCTION

Smoking is the leading cause of preventable death as well as a main risk factor for cancer, cardiovascular and pulmonary diseases. Although considerable progress has been achieved in curbing the tobacco epidemic in many parts of the world, smoking trends continue to increase in low- and middle-income countries[1]. One notable example has been the Eastern Mediterranean region –which the World Health Organization (WHO) has projected the smoking prevalence to increase by 2025[2]. Cigarette smoking is highly prevalent in the Eastern Mediterranean region, due to weak regulatory environments, insufficient surveillance infrastructure and interference from a strong tobacco industry[3]. The problem is compounded by the wide prevalence of waterpipe tobacco smoking[4]. Waterpipe smoking rates in the region are considered the highest worldwide, with notably high prevalence among young adults[5]. This pattern is attributed to multiple factors, including the perception of waterpipe smoking as a less harmful alternative to cigarette smoking, the café culture encouraging social smoking of the waterpipe, and appeal of flavored waterpipe tobacco[6, 7].

The World Health Organization (WHO) Framework Convention on Tobacco Control requires parties to collect data on tobacco use and exposure on a regular basis to monitor smoking trends and policy implementation[8]. To date, surveillance of tobacco use among adults in the Eastern Mediterranean region has been limited. For example, routinely available data from the Global Adult Tobacco Survey (GATS) are only available in Egypt (2009)[9], Qatar (2013)[10] and Pakistan (2014)[11]. Other surveillance efforts in the region have been limited to specific populations, such as youth[12], university students[13, 14], and healthcare professionals [15]. These limitations in the available smoking prevalence data justify the need for detailed national prevalence data on both cigarette and waterpipe smoking among adults in Eastern Mediterranean countries.

In Lebanon, the most recent national estimates for adult cigarette smoking date back to 2013[2] when the prevalence of current cigarette smoking was 34% among males and 19% among females. The national estimates for waterpipe tobacco smoking prevalence (25.3%) date back to 2009, when the prevalence rate was 26.5% among males and 24.3% among females[16]. According to Jordan STEPS 2019 survey, 65.3% of men and 16.4% of women were current smokers of any tobacco products[17]. As for the West Bank, the most recent national estimates were from the Palestinian Family Survey in 2010, when the prevalence rate for cigarette smoking was 29.9% among adults (49.7% among men and 3.5% among women)[18].

Given that the most recent national prevalence estimates across the three countries date back to one decade, this study sought to estimate contemporary prevalence rates of current cigarette and waterpipe smoking in Lebanon, Jordan, and the West Bank, and their correlates. Further, the issue of dual tobacco use has not been sufficiently explored in studies coming from the region, and as such, this study examined the dual use of cigarette and waterpipe tobacco in these three countries.

METHODS
Data source
We conducted nationally-representative in-person cross-sectional household surveys in Lebanon, Jordan, and the West Bank between June and August 2019. Eligible respondents included males

and females aged 18 years and older, residing in each of the countries as their primary place of residence, regardless of nationality.

The sample size was calculated to estimate the prevalence of current waterpipe smoking for males and females in each country based on previously reported prevalence rates [2, 19] with a margin of error of 5% if the prevalence rate is more than 10% or with a margin of error of half of the assumed prevalence if it is less than 10%. The average number of individuals or households sampled per cluster and the design effect were taken into consideration. A design effect of 2.0 was used based on the recommendations of the Global Adult Tobacco Survey (GATS) manual. With an 80% power and α=0.05, the minimum number of clusters needed in the countries ranged from 16 to 28 and the number of subjects ranged from 480 to 840 persons. Since one male and one female were to be selected from each household, the largest number of clusters and households (28 clusters and 1680 subjects; 840 men and 840 women) was the sample size for each country.

A multistage cluster sampling approach with probability-proportional-to-size random selection method was followed. In each country, the sample of households was chosen in two stages. First, well-defined clusters were selected within each governorate (i.e., province). Second, housing units were selected within each selected cluster. The sampling frame for clusters was specific to the characteristics of each country. In Lebanon, all eight governorates were selected for sampling: Akkar, Baalbek-Hermel, Bekaa, Beirut, Mount Lebanon, Nabatieh, North Lebanon, and South Lebanon. In Jordan, all 12 governorates were included in the study: Ajloun, Amman, Aqaba, Balqa, Irbid, Jerash, Karak, Ma'an, Madaba, Mafraq, Tafilah, and Zarqa. In the West Bank, all 11 governorates of the West Bank were selected: Bethlehem, East Jerusalem, Hebron, Jenin, Qalqilya, Nablus, Ramallah and Al-Bireh, Jericho, Salfit, Tubas, and Tulkarm. The Palestinian governorates in Gaza were excluded due to logistical barriers. The second stage of household selection involved choosing a random sample of 30 households from a complete list of households in a selected area, based on local administrative sources or household lists from the most recent census. One eligible male and one female resident, who consider the site of data collecrtion as their primary place of residence, were selected from each selected household. In Lebanon and Palestine, if an eligible female or male was not available for interview at the time of household visit, additional households were selected until an equal number of males and females was reached. In Jordan, additional households were selected that yielded a higher number of males than females. After eligibility screening, we provided potential respondents with information about the study and asked them to provide verbal consent to participate as per IRB approval. With the exception of aforementioned respondent selection, the same methods and recruitment protocol were used in all three countries.

Data collection
Data were collected using the same structured, Arabic-language questionnaire, with selected questions tailored to local context for each country. In the three countries, the surveys were administered face-to-face by trained interviewers. Prior to data collection, each country team pretested the questionnaires with 10-15 individuals of similar characteristics to that of the survey respondents. Minor amendments to wordings of a few questions were applied.. Each country team then piloted with 10-15 individuals before data collection proceeded. No changes following

piloting were needed. Data collectors in the three countries were trained on the ethics of data collection, consenting, sampling methodology and on the survey questions, using the same training manual. The training included a review of each questionnaire item, followed by practice sessions which involved role play as interviewer and interviewee which focused on probing to make sure all interviewees give full answers to ensure that there is no missing data for the analysis.

Measures

Respondents were asked if they had ever tried cigarettes or waterpipe tobacco. Among ever users of each product, respondents were asked if they were current users of the product. Current cigarette smoking was defined as currently smoking cigarettes every day or some days. Similarly, current waterpipe smoking was defined as currently smoking tobacco in a waterpipe every day or some days. Among current cigarette smokers, respondents were asked about the number of cigarettes smoked per day. Dual current smokers included both cigarette and waterpipe smokers while any current smoker included cigarette or waterpipe smokers. Among current waterpipe tobacco smokers, respondents were asked about the number of waterpipe sessions they smoked at home per week, the number of waterpipe sessions they smoked in a café per week, and whether they usually smoked flavored waterpipe tobacco. We assessed the demographic characteristics of respondents, including their sex, age in years, marital status, educational attainment, and household monthly income. The survey instrument can be found as supplementary material.

Statistical analysis

Descriptive statistics were used to summarize the study participants' demographic and socio-economic characteristics. We estimated overall gender-specific prevalence rates of cigarettes and waterpipe smoking and their 95% confidence intervals (CI) within each country. For the purpose of calculation of age-standardized prevalence rates, the WHO World Standard Population which reflects the average age structure of the world's population expected over the next generation, from 2000 to 2025 was used. Multivariable logistic regression analysis was conducted to examine factors associated with current cigarette smoking and current waterpipe smoking in separate models for each country. The independent variables tested in these models included gender (female vs. male), age group in years (18-29, 30-49, 50-64, and 65 or older), educational attainment (primary school or less, middle school, high school/diploma, and university), marital status (ever married vs. never married) and individual monthly income (quartiles within each country). Odds ratios (ORs) and their 95% CIs were estimated from the models. A p-value of less than 0.05 was considered statistically significant. Respondents with missing data on outcome measures or covariates were excluded from models on a case-wise basis. Data were analyzed using Stata statistical software version 16 (StataCorp, College Station, TX).

Patient and Public Involvement

There was no patient public involvement in the design, conduct, reporting, or dissemination plans of our research.

RESULTS

A total of 1,680 respondents in Lebanon, 1,925 in Jordan, and 1,679 in the West Bank completed the surveys. The non-response rate was 33.9% in Lebanon, 3.7% in Jordan and 7.74% in the

West Bank. Table 1 presents the characteristics of respondents by gender in each country. Females represented 50.0% of the sample in Lebanon, 44.6% in Jordan and 50.0% in the West Bank. Almost 45.1% of respondents in Lebanon, 45.9% of respondents in Jordan, and 41.3% of respondents in the the West Bank were younger than 50 years old. The majority (80.8%) of respondents in Lebanon, 75% of respondents in Jordan and 81.5% of respondents in the West Bank were ever married. Almost one-fifth (20.7%) of respondents in Lebanon, 25.1 % in Jordan, and 16.2 % in the West Bank had completed university education.

Table 1. Socio-demographic characteristics by gender and country 2019

Variable	Lebanon		Jordan		West Bank	
	Male (n=840)	Female (n=840)	Male (n=1067)	Female (n=858)	Male (n=839)	Female (n=840)
	(%) n	(%) n	(%) n	(%) n	(%) n	(%) n
Age, in years						
18 – 29	(22.7) 191	(29.3) 246	(26.4) 282	(27.7) 238	(32.9) 276	(25.7) 216
30 – 49	(44.5) 374	(45.7) 384	(45.2) 482	(46.6) 400	(37.8) 317	(44.8) 376
50 – 64	(28.3) 238	(23.2) 195	(19.9) 212	(18.9) 162	(25.4) 213	(28.6) 240
≥65	(4.4) 37	(1.8) 15	(8.5) 91	(6.8) 58	(3.9) 33	(1.0) 8
Marital Status						
Never married	(20.4) 170	(18.1) 153	(25.0) 210	(12.1) 102	(22.1) 185	(8.2) 69
Ever married	(79.8) 670	(81.8) 687	(75.0) 629	(75.0) 738	(75.0) 629	(87.9) 738
Education						
Primary school or less	(17.4)146	(11.9) 100	(22.3) 238	(24.0) 206	(44.3) 372	(50.4) 423
Middle school	(21.7) 182	(21.3) 179	(41.1) 439	(36.6) 314	(33.7) 283	(25.8) 217
High school/diploma	(40.0) 336	(46.4) 390	(12.0) 128	(13.9) 119	(7.5) 63	(5.9) 50
University	(21.0) 176	(20.4) 171	(24.6) 262	(25.5) 219	(14.4) 121	(17.9) 150
Monthly Income*						
Quartile 1	(7.51) 62	(9.1) 75	(21.7) 227	(24.9) 207	(21.2) 174	(26.6) 214
Quartile 2	(39.5) 326	(38.8) 321	(39.4) 411	(38.5) 320	(41.9) 344	(44.0) 355
Quartile 3	(39.1) 323	(38.7) 320	(25.1) 262	(23.7) 197	(19.8) 163	(16.5) 133
Quartile 4	(13.9) 115	(13.4) 111	(13.8) 144	(12.9) 107	(17.0) 140	(12.9) 104
No income	(1.7) 14	(1.6) 13	(2.2) 23	(3.2) 27	(2.2) 18	(4.0) 34

*Income quartile levels: **Lebanon:** [1] <$529.88; [2] $529.88 - < $993.53; [3] $993.53 - < $1,987.05; [4] ≥ $1,987.05. **Jordan:** [1] < $423.13; [2] $423.13 = < $705.22; [3] $705.22 - < $1,269.39. **West Bank:** [1] < $610.04; $610.04 - < $1,067.57; [3] $1,067.57 - < $1,525.10; [4] ≥ 1,525.10.

Prevalence of cigarette and waterpipe tobacco smoking

Table 2 shows the crude and age-standardized prevalence rates of current cigarette smoking, current waterpipe smoking, dual smoking and any smoking, by country. Overall, the crude prevalence rate (95% CI) for current cigarette smoking was 35.1% (32.8, 37.4) in Lebanon, 32.0% (29.9, 34.1) in Jordan and 28.2% (26.1, 30.5) in the West Bank. The prevalence rate for

current waterpipe smoking was 39.5% (37.1, 41.8) in Lebanon, 11.0% (9.6, 12.4) in Jordan, and 12.9% (11.4, 14.6) in the West Bank. The overall rate for dual current smoking was 3.6% (2.8, 4.6) in Lebanon, 2.8% (2.1, 3.6) in Jordan, and 4.4% (3.5, 5.5) in the West Bank. As for any current smoking, the prevalence rate was 70.9% (68.7, 73.1) in Lebanon, 40.2% (38.0, 42.4) in Jordan, and 36.7% (34.4, 39.1) in the West Bank. Respectively, the age standardized prevalence rates of current cigarette and waterpipe smoking were 27.8% and 38.1% in Lebanon, 25.5% and 12.0% in Jordan, and 26.3% and 14.1% in the West Bank.

Table 2. Crude and age-standardized prevalence rates (ASR) and their 95% confidence intervals (CI) of current cigarette smoking, current waterpipe smoking, dual smoking, and any smoking in Lebanon, Jordan, and the West Bank, 2019.

Country/ gender	Current cigarette smoking		Current waterpipe smoking		Dual smoking		Any Smoking	
	Crude (95% CI)	ASR (95% CI)	Crude (95% CI)	ASR (95% CI)	Crude (95% CI)	ASR (95% CI)	Crude (95% CI)	ASR (95% CI)
Lebanon								
Male	48.6 (45.1, 52.0)	38.6 (30.9, 46.4)	32.7 (29.6, 36.0)	35.6 (26.4, 44.7)	5.5 (4.0, 7.2)	5.8 (2.1, 9.6)	75.8 (72.8, 78.7)	68.4 (57.0, 79.8)
Female	21.5 (18.8, 24.5)	15.9 (11.3, 20.5)	46.2 (42.8, 49.6)	39.8 (29.4, 50.3)	1.8 (1.0, 2.9)	0.9 (0.4, 1.3)	66.0 (62.6, 69.2)	54.9 (43.5, 66.3)
Total	35.1 (32.8, 37.4)	27.8 (22.9, 32.6)	39.5 (37.1, 41.8)	38.1 (31.2, 44.9)	3.6 (2.8, 4.6)	3.6 (1.4, 5.7)	70.9 (68.7, 73.1)	62.3 (54.1, 70.4)
Jordan								
Male	50.4 (47.4, 53.5)	39.7 (32.9, 46.4)	13.5 (11.5, 15.7)	15.1 (9.4, 20.7)	4.3 (3.2, 5.7)	4.6 (1.6, 7.6)	59.6 (56.6, 62.6)	50.1 (41.9, 58.3)
Female	9.1 (7.3, 11.2)	8.0 (4.2, 11.8)	7.8 (6.1, 9.8)	8.3 (3.8, 12.9)	0.8 (0.3, 1.7)	0.5 (0.1, 0.9)	16.1 (13.7, 18.7)	15.9 (10.0, 21.8)
Total	32.0 (29.9, 34.1)	25.5 (21.4, 29.6)	11.0 (9.6, 12.4)	12.0 (8.3, 15.7)	2.8 (2.1, 3.6)	2.8 (1.1, 4.4)	40.2 (38.0, 42.4)	34.8 (29.6, 40.0)
West Bank								
Male	53.4 (50.0, 56.8)	45.0 (37.5, 52.6)	18.0 (15.5, 20.8)	16.6 (11.5, 21.7)	8.0 (6.2, 10.0)	6.4 (3.5, 9.2)	63.4 (60.0, 66.7)	55.3 (46.6, 63.9)
Female	3.1 (2.0, 4.5)	1.6 (1.0, 2.3)	7.9 (6.1, 9.9)	12.2 (4.6, 19.9)	0.8 (0.3, 1.7)	0.5 (0.1, 0.9)	10.1 (8.2, 12.4)	13.4 (5.7, 21.0)
Total	28.2 (26.1, 30.5)	26.3 (21.2, 31.4)	12.9 (11.4, 14.6)	14.1 (9.9, 18.2)	4.4 (3.5, 5.5)	3.8 (2.0, 5.7)	36.7 (34.4, 39.1)	36.5 (30.3, 42.8)

Patterns of cigarette and waterpipe smoking
Table 3 presents the patterns of cigarette and waterpipe smoking among current smokers according to gender and country. In Lebanon, almost half of current cigarette smokers reported smoking ≥20 cigarettes per day (42.6% of males and 51.9% of females). In Jordan, more than half of male current cigarette smokers (52.0%) and one third of female cigarette smokers (33.3%) reported smoking ≥20 cigarettes per day. In the West Bank, among those who currently smoke cigarettes, 37.5% of males and 3.8% of females reported smoking ≥20 cigarettes per day.

The majority of waterpipe smokers in Lebanon used flavored tobacco (86.2% of males and 89.2% of females), smoked more than 3 sessions at home (92.5% of males and 86.9% of females) and smoked three sessions or less per week in a café (90.0% of males and 96.3% of

females). In Jordan, the majority of waterpipe smokers used flavored tobacco (92.3% of males and 98.5% of females), the majority of male respondents (70.5%) and less than half of females (46.9%) smoked more than three waterpipe sessions at home, and the majority of respondents smoked three sessions or less per week in a café (62.9% of males and 85.7% of females). In the West Bank, the majority of waterpipe smokers used flavored tobacco (94.6% of males and 93.9% of females), 85.7% of males and 95.4% of females smoked more than 3 sessions of waterpipe at home, and 97.7% of males and 95.5% of females smoked three sessions or less per week in a café.

Table 3. Patterns of cigarette and waterpipe smoking among current smokers according to gender by country in 2019

Variable	Lebanon		Jordan		West Bank	
	Males	Females	Males	Females	Males	Females
	(%) n	(%) n	(%) n	(%) n	(%) n	(%) n
Cigarettes per day						
<10	(35.0) 143	(34.8) 63	(3.4) 18	(18.0) 14	(9.4) 42	(23.1) 6
10 – 20	(42.6) 174	(51.9) 94	(44.6) 240	(48.7) 38	(53.1) 238	(73.1) 19
>20	(22.3) 91	(13.3) 24	(52.0) 280	(33.3) 26	(37.5) 168	(3.8) 1
Total	(100.0) 408	(100.0) 181	(100.0) 538	(100.0) 78	(100.0) 448	(100.0) 26
Waterpipe sessions at home, per week						
≤3	(7.5) 19	(13.1) 49	(29.5) 33	(53.1) 34	(85.7) 108	(95.4) 62
>3	(92.5) 234	(86.9) 326	(70.5) 79	(46.9) 30	(14.3) 18	(4.6) 3
Waterpipe sessions at café, per week						
≤3	(90.9) 180	(96.3) 236	(62.9) 22	(85.7) 6	(97.7) 85	(95.5) 21
>3	(9.1) 18	(3.7) 9	(37.1) 13	(14.3) 1	(2.3) 2	(4.5) 1
Type of waterpipe tobacco smoked						
Flavored	(86.2) 237	(89.2) 346	(92.3) 132	(98.5) 66	(94.6) 141	(93.9) 62
Non-flavored	(13.8) 38	(10.8) 42	(7.7) 11	(1.5) 1	(5.4) 8	(6.1) 4

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Factors associated with current cigarette smoking

Table 4 presents the results of the multivariable analysis of factors associated with current cigarette smoking by country. In Lebanon, males were more likely than females to be current cigarette smokers (OR: 5.07; 95% CI: 3.73, 6.89). Compared with young adults 18-29 years old, respondents who were older were more likely to be current smokers: (OR: 5.52; 95% CI: 3.22, 9.49) among those 30-49 years old, (OR: 6.34; 95% CI: 3.57, 11.26) among adults 50-64 years old, and (OR: 2.84; 95% CI: 1.15, 7.05) among adults ≥65 years old. Compared with adults who had a primary school education or less, adults with a high school education (OR: 0.44; 95% CI: 0.27, 0.72) and those with a university education (0.52; 95% CI: 0.29, 0.92) were significantly less likely to be current cigarette smokers.

In Jordan, males were significantly more likely than females to be current cigarette smokers (OR: 13.77; 95% CI: 9.29, 20.44). Adults ≥65 years old were less likely than those 18-29 years old to be current cigarette smokers (OR: 0.35; 95% CI: 0.19, 0.65). Compared with adults who had a primary school education or less, adults with a high school education (OR: 0.61; 95% CI: 0.38, 0.97) and those with a university education (OR: 0.61; 95% CI: 0.41, 0.91) were less likely to be current cigarette smokers. In addition, adults in the highest income quartile were significantly more likely to be current smokers compared with adults in the lowest income quartile (OR: 1.68; 95% CI: 1.05, 2.69).

Finally, in the West Bank, males were also significantly more likely than females to be current cigarette smokers (OR: 66.95; 95% CI: 29.28, 153.10). Adults ≥65 years old were less likely than those 18-29 years old to be cigarette smokers (OR: 0.33; 95% CI: 0.12, 0.88). Compared to adults with a primary school education or less, adults with a middle school education (OR: 0.58; 95% CI: 0.39, 0.84) and those with a university education (OR: 0.57; 95% CI: 0.35, 0.93) were significantly less likely to be current cigarette smokers.

Table 4. Multivariable analysis of factors associated with current cigarette smoking among adults by country in 2019

Variable	Lebanon		Jordan		West Bank	
	OR (95% CI)	p	OR (95% CI)	p	OR (95% CI)	p
Gender						
Female	reference		reference		reference	
Male	5.07 (3.73, 6.89)	<0.001	13.77 (9.29, 20.44)	<0.001	66.95 (29.28, 153.10)	<0.001
Age, in years						
18 – 29	reference		reference		reference	
30 – 49	5.52 (3.22, 9.49)	<0.001	1.06 (0.77, 1.54)	0.76	1.43 (0.89, 2.27)	0.13
50 – 64	6.34 (3.57, 11.26)	<0.001	0.89 (0.57, 1.37)	0.59	1.64 (0.38, 1.05)	0.08
≥65	2.84 (1.15, 7.05)	0.024	0.35 (0.19, 0.65)	0.001	0.33 (0.12, 0.88)	0.03
Education						
Primary school or less	reference		reference		reference	
Middle school	0.94 (0.58, 1.52)	0.79	0.83 (0.59, 1.17)	0.31	0.58 (0.39, 0.84)	<0.001
High school/diploma	0.44 (0.27, 0.72)	0.001	0.61 (0.38, 0.97)	0.04	0.68 (0.37, 1.26)	0.22
University	0.52 (0.29, 0.92)	0.02	0.61 (0.41, 0.91)	0.02	0.57 (0.35, 0.93)	0.03

Marital Status						
Not Married	reference		reference		reference	
Married	0.61 (0.36, 1.02)	0.06	1.18 (0.83, 1.67)	0.35	1.12 (0.69, 1.80)	0.64
Monthly Income*						
Quartile 1	reference		reference		reference	
Quartile 2	1.09 (0.60, 2.01)	0.77	1.42 (1.00, 2.03)	0.05	0.83 (0.54,1.26)	0.37
Quartile 3	1.06 (0.56, 2.00)	0.87	1.46 (0.99, 2.15)	0.06	1.17 (0.71, 1.93)	0.54
Quartile 4	1.61 (0.76, 3.40)	0.21	1.68 (1.05, 2.69)	0.03	0.62 (0.36, 1.06)	0.08
No income	1.54 (0.44, 5.40)	0.50	0.98 (0.41, 2.36)	0.96	0.37 (0.12, 1.21)	0.10

*Income quartile levels: **Lebanon:** [1] <$529.88; [2] $529.88 - < $993.53; [3] $993.53 - < $1,987.05; [4] ≥ $1,987.05. **Jordan:** [1] < $423.13; [2] $423.13 = < $705.22; [3] $705.22 - < $1,269.39. **West Bank:** [1] < $610.04; $610.04 - < $1,067.57; [3] $1,067.57 - < $1,525.10; [4] ≥ 1,525.10.

Factors associated with current waterpipe tobacco smoking

Table 5 presents the results of multivariable analysis of factors associated with current waterpipe tobacco smoking by country. In Lebanon, males were less likely than females to be current waterpipe smokers (OR: 0.49; 95% CI: 0.37, 0.64). In addition, adults older than 18-29 years old were less likely to be current waterpipe smokers: (OR: 0.30; 95% CI: 0.18, 0.49) among 30-49 years old, (OR: 0.08; 95% CI: 0.04, 0.15) among 50-64 years old, and (OR: 0.03; 95% CI: 0.01, 0.14). Compared to adults with a primary school education or less, adults with a high school education were more likely to be waterpipe smokers (OR: 1.87; 95% CI: 1.05, 3.34). Compared with adults in the lowest income quartile, those in the second (OR: 2.50; 95% CI: 1.19, 5.26) and third (OR: 2.45; 95% CI: 1.13, 5.30) quartiles were more likely to be current waterpipe smokers.

In Jordan, males were more likely than females to be current waterpipe smokers (OR: 1.92; 95% CI: 1.40, 2.62). Compared with adults 18-29 years old, older adults were less likely to be waterpipe smokers: (OR: 0.66; 95% CI: 0.44, 0.99) among those 30-49 years old, (OR: 0.45; 95% CI: 0.27, 0.75) among those 50-64 years old, and (OR: 0.07; 95% CI: 0.02, 0.31) among those ≥65 years old.

Similarly, in the West Bank, males were more likely than females to be current waterpipe smokers (OR: 2.69; 95% CI: 1.85, 3.92). Compared with adults 18-29 years old, older adults were less likely to be waterpipe smokers: (OR: 0.48; 95% CI: 0.30, 0.77) among adults 30-49 years old, (OR: 0.19; 95% CI: 0.09, 0.35) among adults 50-64 years old, and (OR: 0.19; 95% CI: 0.05, 0.77) among adults ≥65 years old.

Table 5. Multivariable analysis of factors associated with current waterpipe smoking among adults by country in 2019

Variable	Lebanon		Jordan		West Bank	
	OR (95% CI)	p	OR (95% CI)	p	OR (95% CI)	p
Gender						
Female	reference		reference		reference	
Male	0.49 (0.37, 0.64)	<0.001	1.92 (1.40, 2.62)	<0.001	2.69 (1.85, 3.92)	<0.001

Age, in years							
18 – 29	reference		reference		reference	
30 – 49	0.30 (0.18, 0.49)	<0.001	0.66 (0.44, 0.99)	0.04	0.48 (0.30, 0.77)	0.002
50 – 64	0.08 (0.04, 0.15)	<0.001	0.45 (0.27, 0.75)	0.02	0.19 (0.09, 0.35)	<0.001
≥65	0.03 (0.01, 0.14)	<0.001	0.07 (0.02, 0.31)	<0.001	0.19 (0.05, 0.77)	0.02
Education						
Primary school or less	reference		reference		reference	
Middle school	1.03 (0.58, 1.86)	0.91	1.34 (0.87, 2.08)	0.18	1.37 (0.90, 2.10)	0.14
High school/diploma	1.87 (1.05, 3.34)	0.03	1.14 (0.64, 2.02)	0.65	1.72 (0.84, 3.51)	0.14
University	1.90 (0.98, 3.69)	0.06	1.19 (0.73, 1.95)	0.47	1.26 (0.75, 2.13)	0.39
Marital Status						
Not Married	reference		reference		reference	
Married	1.54 (0.91, 2.63)	0.11	1.06 (0.71, 1.58)	0.76	0.66 (0.41, 1.06)	0.08
Monthly Income*						
Quartile 1	reference		reference		reference	
Quartile 2	2.50 (1.19, 5.26)	0.02	0.75 (0.49, 1.14)	0.18	0.71 (0.43, 1.18)	0.18
Quartile 3	2.45 (1.13, 5.30)	0.02	1.05 (0.67, 1.66)	0.82	0.89 (0.49, 1.61)	0.50
Quartile 4	1.93 (0.79, 4.74)	0.15	1.44 (0.87, 2.37)	0.16	1.20 (0.66, 2.20)	0.66
No income	1.27 (0.28, 5.84)	0.76	1.01 (0.37, 2.75)	0.98	0.72 (0.22, 2.37)	0.22

*Income quartile levels: **Lebanon:** [1] <$529.88; [2] $529.88 - < $993.53; [3] $993.53 - < $1,987.05; [4] ≥ $1,987.05. **Jordan:** [1] < $423.13; [2] $423.13 = < $705.22; [3] $705.22 - < $1,269.39. **West Bank:** [1] < $610.04; $610.04 - < $1,067.57; [3] $1,067.57 - < $1,525.10; [4] ≥ 1,525.10.

DISCUSSION

This study provides contemporary estimates of the prevalence and patterns of cigarette and waterpipe smoking among adults in Lebanon, Jordan and the West Bank using nationally representative surveys. Findings from the study raise renewed concerns over tobacco use in these countries, which have some of the highest smoking prevalence rates globally: more than two in three adults in Lebanon are current smokers of combustible tobacco products, and almost two-thirds of adult males in Jordan and the West Bank are also current smokers. Generally, males were more likely to be current smokers than females. However, almost half of adult females were current waterpipe smokers in Lebanon, exceeding by 40% the prevalence among adult males in that country.

Our study showed comparable results to previously reported prevalence estimates of current cigarette smoking in Lebanon. Wereport slightly higher estimates for males and females compared to the most recent published estimates where the rates of current cigarette smoking for males and females was 34% and 19%, respectively[2]. As for waterpipe tobacco smoking, our study reports a higher prevalence particularly among females when compared to the latest reported rate of 24.3%[16] This may be partially explained by the fact that waterpipe smoking is increasingly becoming a socially normative behavior and remains poorly unregulated, widely available and affordable in Lebanon[20].

In Jordan, our prevalence estimate of current smoking of any tobacco products among men (50.1%) was lower than the previously reported rate (65.3%) in the STEP 2019. Among Jordanian women, our estimate (15.9%) was consistent with the STEP 2019 estimate (16.4%). [17]. In the West Bank, adult prevalence estimates of cigarette smoking among males were markedly higher than previously reported estimates of 49.7%, while for females it was relatively similar, 3.5%[18]. We compare here our findings with previously reported prevalence rates in the three countries, bearing in mind that the methodologies of cited studies might not be comparable.

The gender- and age-specific prevalence rates of cigarette and waterpipe tobacco smoking are generally consistent with previous findings in the three countries[3]. Females in Lebanon had the highest prevalence of waterpipe smoking whereas males in the West Bank had the highest prevalence of cigarette smoking across the three countries. Young adults across all three countries were more likely to smoke waterpipe tobacco in line with previous reports that waterpipe smoking has become widespread among young adults which is also consistent with reported global trends[4, 14, 21, 22]. This may be attributable to the fact that waterpipe smoking is widely perceived to be less harmful than cigarette smoking among young people[6].

Patterns of smoking were different among current cigarette smokers across the three countries. More than one-third of males and females in Lebanon were light smokers, averaging less than ten cigarettes per day. In contrast, only 3.4% of males and 18.0% of females who were current cigarette smokers in Jordan were light smokers. Similarly, in the West Bank, 9.4% of males and 23.1% of females were light smokers. These patterns, combined with the high overall prevalence rates of cigarette smoking, may be suggestive that for a significant proportion of smokers, cigarette smoking may be regarded more as a social behavior, especially in Lebanon. Alternatively, almost all male smokers in Jordan were heavy smokers, suggesting higher levels of addiction, with relevant implications for improving the use of existing smoking cessation services in Jordan. [21].

Finally, it is important to highlight that across all three countries, the overwhelmingly majority of current waterpipe smokers use flavored tobacco, as previously reported in other countries in the EMR. In a study by Hamadeh et al (2021), out of the 2470 students that participated in the study from Egypt, Jordan, Palestine and the United Arab Emirates, the majority of male and female students smoked flavored waterpipe tobacco[23]. This was also observed in Iran where 56% of smokers used flavored waterpipe tobacco. [24]This pattern may be attributed to increased availability of flavored tobacco products, affordability, their unregulated marketing, as well as poor and often misleading labeling [5] calling for the need to consider banning of flavoring in tobacco as a potentially strong regulatory measure[25].

Strengths of this study include the fact that it reports contemporary estimates of smoking prevalence using large, nationally representative surveys, that have been consistently lacking in previous studies. The study used standardized questionnaires across the three countries, allowing for valid cross-country comparisons. Study limitations include the fact that tobacco use was self-reported and not biochemically verified, which may underreport prevalence. In addition, only a small number of females reported current smoking in Jordan and the West Bank. These small sample sizes may have resulted in unreliable estimates of the detailed patterns of cigarette and waterpipe smoking reported for females in the two countries. The study also did not report on

use of other alternative smoking products such as electronic cigarettes[17, 26], heated tobacco, and midwakh [27, 28], which are increasingly more available in the loosely regulated markets of those countries.

CONCLUSION

The alarmingly high prevalence of tobacco smoking in Lebanon, Jordan, and the West Bank highlights the immediate need to strengthen existing tobacco control policies, especially those that address waterpipe tobacco smoking. Regulations should address waterpipe tobacco smoking in relation to all articles of the FCTC (taxation, packaging and labelling, cessation, etc)[29]. Regulations should also be informed by a growing body of research in Lebanon, Jordan, and the West Bank evaluating waterpipe specific intervention for effectiveness[30-33] This should be coupled with regular monitoring of tobacco trends using surveillance data such as the ones reported in this study in order to evaluate progress at national level.Findings from this research provide policy makers with evidence that can support them in calling for improved policies and measures to curb tobacco use.

ACKNOWLEDGEMENTS

Ethics approval

This study involves human participants and was approved by the Institutional Boards at the American University of Beirut (SBS-2019-0097), Jordan University of Science and Technology (14/119/2018), and Birzeit University (2019 (1-1)).

Conflict of Interests

None declared.

Data Availability Statement

Data are available upon reasonable request.

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ECON-WTS 2018

HOUSEHOLD QUESTIONNAIRE
Survey on the Economics of Waterpipe Smoking in Lebanon

HOUSEHOLD INFORMATION PANEL	
HH1. Cluster number: ___ ___ ___	**HH2**. Household number: ___ ___
HH3. Interviewer's name: Name _____ ID number: ___ ___	**HH4**. Supervisor's name: Name_____
HH5. Day / Month / Year of interview: ___ ___ /___ ___ /___ ___ ___ ___ **HH6A**. LOCALITY NAME: _____	**HH6B**. *Governorate:* BEIRUT: …………………………………………….[]1 MOUNT LEBANON: ………………………………[]2 NORTH: …………………………………………….[]3 AKKAR: …………………………………………….[]4 BEKAA: …………………………………………….[]5 SOUTH: …………………………………………….[]6 EL NABATIEH: …………………………………….[]7 BAALBEK-EL HERMEL:………………………….[]8
HH7. Respondent number: ___ ___ ___	

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SECTION A: BACKGROUND CHARACTERISTICS

A1.	Gender	*Interviewer: State gender at sight.* Male............[] 1 Female........[] 2
A2.	What is your age?	___ ___ ___ Years *If the respondent is not sure, the respondent will estimate the age* *Interviewer: round to the nearest integer if necessary.*
A3.	What is your marital status?	Single............................[] 1 Engaged.......................[] 2 Married........................[] 3 Separated.....................[] 4 Divorced......................[] 5 Widow(er)....................[] 6 No response...................[] 777
A4.	What is the highest education level you have obtained?	*Interviewer: participant can choose one item only:* No formal education.................................[] 1 Completed primary school........................[] 2 Completed middle school......................[] 3 Completed high school/equivalent education..[] 4 Completed 1-2-year post-secondary/vocational……………...….....[] 5 Completed university/college.................[] 6 Completed postgraduate degree………...[] 7 Don't know...[] 999 No response...[]777

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A5.	What is your nationality?	*Interviewer: participant can choose more than one nationality* Lebanese …………………..………..[] 1 Syrian …………………………………[]2 Palestinian …………………,………[]3 Other: _____ …,.. []4
A6.	Which of the following best describe your employment status?	*Interviewer: Participant can choose all that apply* Full-time employed in the workforce (including self-employed)......................[] 1 Part-time employed in the workforce (including self-employed)......................[] 2 Unemployed...[] 3 Retired or on a pension............................[] 4 Full-time student....................................[] 5 Part-time student....................................[] 6 Housewife/ Home duties........................[] 7 Other (specify)_____...........[] 8 Don't know..[] 999 No response..[] 777
A7.	What is the best estimate of your **monthly household income**, that is, total income before taxes, or gross income, of all persons in your household combined. We ask this for statistical purposes. We assure your responses will remain strictly confidential.	Less than 800,000 L.L ....[] 1 From 800,000 L.L to less than 1,500,000 L.L....[] 2 From 1,500,000L.L to less than 3,000,000L.L ..[] 3 3,000,000 L.L and more.................................[] 4 Don't know..[] 999 No response..[] 777
A8.	What is the best estimate of your **monthly individual income**, that is, your total income before taxes, or gross income. We ask this for statistical purposes. We assure your responses will remain strictly confidential.	Less than 800,000 L.L ....[] 1 From 800,000 L.L to less than 1,500,000 L.L....[] 2 From 1,500,000L.L to less than 3,000,000L.L ..[] 3 3,000,000 L.L and more.................................[] 4 No income ………………………………....[]5 Don't know..[] 999

HH.3

		No response...[] 777
A9.	In the last month, did you or anyone else in the household had to borrow money to pay any important bills on time, such as electricity, telephone or rent bills?	Yes......................[] 1 No......................[] 2 Don't know……[] 999 No response…...[] 777
A10.	Who usually makes the decisions regarding the daily household purchases? Daily household purchases include grocery or daily essentials etc..	Nobody …………………………….[]1 Respondent alone ……………………..[]2 Respondent and spouse/partner ……..[]3 Respondent and other person …………[]4 Spouse /partner alone …………..……[]5 Someone else. Specify:_____……[]6 Don't know…………………………….[] 999 No response…………………………...[] 777
A11.	Who usually makes the decisions regarding the large household purchases? Large household purchases include furniture or a car etc…	Nobody …………………………….[]1 Respondent alone ……………………..[]2 Respondent and spouse/partner ..……..[]3 Respondent and other person …………[]4 Spouse/partner alone …………..………[]5 Someone else. Specify:_____……[]6 Don't know…………………………….[] 999 No response…………………………...[] 777

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SECTION B: TOBACCO SMOKING

Tobacco Products

B1.	Do you currently use any tobacco products (cigarettes, arguileh, other tobacco products)?	Yes ………………………[]1 No ………………………[]2 **If answer is "no", skip question B2-B35**
B2.	On average, how many of the following products do you **currently** smoke each (day/week/month)? (One option)	*Interviewer: if respondent reports smoking the product but not every (day/week/month), enter 888* **Regular Cigarettes?** ___ ___ ___ per day ___ ___ ___ per week ___ ___ ___ per month **Number of arguileh sessions at home or someone else's home?** ___ ___ ___ per day ___ ___ ___ per week ___ ___ ___ per month **Number of arguileh sessions in a café or restaurant?** ___ ___ ___ per day ___ ___ ___ per week ___ ___ ___ per month **Do you smoke any other tobacco products?** Yes …………………..[]1 No ……………………[]2 If yes, specify:

	Every day	Some days	Not at all
E-cigarettes			
Cigars			
Chewing Tobacco			

HH.5

		Midwakh/ Dokha		
		Roll your own cigarettes		
		Other. Specify _____		

B3.	Are you aware of an increase in the price of tobacco products recently?	Yes ………………………….. []1 No ……………………………[]2 Specify: Cigarettes Waterpipe tobacco Both

B4.	If yes, please report the before and after price of the products that you usually purchase	*Product*	*Unit*	*Price Before*	*Price After*
		Cigarettes	*Pack*		
		Waterpipe tobacco products	*Select unit: 50 g, 100g, 250g, 500g, 1kg*		

B5.	Did the price change affect your purchase patterns?	Yes ………………………….. []1 No ……………………………[]2

B6.	If yes, did it:	Increase your purchase patterns …….. []1 Decrease your purchase patterns …….. []2

	Regular Cigarettes	

B7.	Have you smoked at least 100 cigarettes in your entire life?	Yes ....[] 1 No..[] 2 Don't know ....[] 999 No response ....[] 777 **If answer is "no", skip question B4.**

B8.	Do you <u>now</u> smoke cigarettes?	Every day..[] 1
		Some days ....[] 2
		Not at all ....[] 3
		Don't know ....[] 999
		No response ....[] 777
		If the answer is "every day" or "somedays", skip question B5.
B9.	Do you think you might smoke cigarettes, even once, over the next year?	Definitely yes ………………………… []1
		Probably yes …………………………[]2
		Probably no …………………………..[]3
		Definitely no …………………….......[]4
		If answer is "probably no" or definitely no", skip questions B6 – B10
B10.	The last time you bought cigarettes for yourself, how many cigarette packs did you buy?	*Interviewer: record number /check unit* ___ ___ ___ Packs...[] 2 Carton...[] 3 Other (specify): _____.....[] 4 Never bought cigarettes ....[] 5 If answer is "never bought cigarettes", skip questions B7-B10
B11.	In total, how much money did you pay for the last purchase?	*Interviewer: if participant doesn't know, enter 999* ___ ___ ___ L.L.
B12.	What was the cigarette pack brand name?	*Interviewer: record brand name* _____
B13.	Which of the following statements best describes your thinking about giving up <u>cigarette</u> smoking?	In the next 30 days ………………… []1
		In the next 6 months ………………..[]2
		In the next year ……………………..[]3
		More than one year from now ...……[]4
		I don't want to quit …………………[]5
		Don't know ....[] 999
		No response ....[] 777

B14.	In the past 12 months, have you stopped smoking cigarettes for one day or longer because you were trying to quit?	Yes ………………………………...[]1 No …………………………………[]2 Don't know ....[] 999 No response ....[] 777
Arguileh		
B15.	Have you <u>ever</u> smoked tobacco in a arguileh even just a few puffs?	Yes ....[] 1 No..[] 2 Don't know ....[] 999 No response ....[] 777 **If answer is "no", skip question B12**
B16.	Do you <u>now</u> smoke tobacco in a waterpipe?	Every day.....................................[] 1 Some days ....[] 2 Not at all ....[] 3 Don't know ....[] 999 No response ....[] 777 **If answer is "everyday" or "somedays" skip question B13.**
B17.	Do you think you might smoke waterpipe, even once, over the next year?	Definitely yes ………………………. []1 Probably yes ……………………….[]2 Probably not ………………….……[]3 Definitely not …………………….....[]4 **If answer is "probably not" or "definitely not", skip questions B14 - B35**
B18.	What flavor do you mostly prefer smoking?	Non-flavored ……………………….…..[]1 Flavored. Insert flavor: _____ .…[]2
B19.	The last time you smoked arguileh at a café/restaurant, how many arguileh smoking heads/rocks did you have and how much did you pay for these heads/rocks?	*Interviewer: record number and prices* Number:___ ___ ___ Price: ___ ___ ___ **If quantity is zero "0", skip questions B16- B22**

HH.8

B20.	The last time you smoked arguileh at a café/restaurant, how much did you pay?	*Interviewer: if participant doesn't know, enter 999* Record Price: ___ ___ ___ L.L.
B21.	How many heads/rocks did they offer you for free?	*Interviewer: Record number* ___ ___ ___ *Don't know* ....*[] 999* *No response* ....*[] 777*
B22.	Think of the last time you smoked arguileh at a café. Which of the following best describes the type of establishment?	Café …………………………..[]1 Baladi/ Sha'bi Café ………….[]2 Internet café………………..…[]3 Restaurant …………………..…[]4 Other _____………..[]5
B23.	Does the establishment typically serve women?	Yes………………………….…[] 1 No …………………………….[] 2 Don't know ....[] 999 No response ....[] 777
B24.	Approximately one year ago, how many arguileh smoking heads/rocks did you smoke during a typical arguileh cafe visit each month and how much did you pay for these heads/rocks per month?	*Interviewer: record number and prices if participant doesn't know the price, put 999* Number:___ ___ ___ per month Price: :___ ___ ___ per month Don't know ....[] 999 No response ....[] 777
B25.	Approximately one year ago, how much did you pay at a typical arguileh café visit each month?	*Interviewer: Record price* ___ ___ ___ L.L. per month Don't know ....[] 999 No response ....[] 777
B26.	How many heads did they offer you for free?	*Interviewer: Record number* ___ ___ ___ *Don't know* ....*[] 999* *No response* ....*[] 777*

B27. The last time you bought arguileh tobacco pack for yourself from the store, how much arguileh tobacco did you buy?	*Interviewer: record number and check unit* ___ ___ ___ 50 gram packs.......................[] 1 ___ ___ ___ 100 gram packs.......................[] 2 ___ ___ ___ 250 gram packs.......................[] 3 ___ ___ ___ 500 gram packs.......................[] 4 ___ ___ ___ 1 kilogram packs.....................[] 5 ___ ___ ___ Other pack - specify weight:__.[] 6 ___ ___ ___ Bulk - specify weight: ____...[] 7 Never bought arguileh tobacco from store ….[]8 **If the answer is "Never bought arguileh tobacco" skip questions B24 – B27**
B28. In total, how much did you pay for the purchase of arguileh tobacco from the store?	*Interviewer: if participant doesn't know, enter 999* ___ ___ ___ L.L.
B29. What was the arguileh tobacco brand name?	*Interviewer: record brand name* _____
B30. Approximately one year ago, how much arguileh tobacco did you buy from the store each month?	*Interviewer: record number and check unit* ___ ___ ___50 gram packs...........................[] 1 ___ ___ ___100 gram packs.......................[] 2 ___ ___ ___250 gram packs..........................[] 3 ___ ___ ___500 gram packs..........................[] 4 ___ ___ ___1 kilogram packs......................[] 5 ___ ___ ___Other pack - specify weight: __.[] 6 ___ ___ ___Bulk - specify weight: _____...[] 7 Never bought arguileh tobacco..............[] 8 Don't know ....[] 999 No response ....[] 777

HH.10

B31.	Approximately one year ago, how much did you spend on arguileh tobacco purchases from stores each month ?	*Interviewer: if participant doesn't know, enter 999* ___ ___ ___ L.L. per month Don't know ....[] 999 No response ....[] 777
B32.	The last time you used arguileh delivery service, how many arguileh smoking heads/rocks did you buy and how much did you pay for these heads/rocks?	*Interviewer: record number and prices, if participant doesn't know, enter 999* Number:___ ___ ___ Price:___ ___ ___ **if the quantity is zero "0", skip questions B29–B33**
B33.	The last time you used arguileh delivery service, how much did you pay?	*Interviewer: if participant doesn't know, enter 999* *Insert price:* ___ _____ *L.L.*
B34.	How many heads did they offer you for free?	*Interviewer: Record number* ___ ___ ___ *Don't know ....[] 999* *No response ....[] 777*
B35.	Approximately one year ago, how many arguileh smoking heads/rocks did you order using arguileh delivery services each month and how much did you pay for these heads/rocks per month?	*Interviewer: In case the participant expressed difficulty, ask him how many arguileh's does he order per month and typically how many heads come with the arguileh and then multiply them. For example, if on average you smoke 20 arguileh's per month and it comes with 2 heads, then your total is 20x2=40.* *Record number and prices, if participant doesn't know, enter 999* Number:___ ___ ___ per month Price: ___ ___ ___ per month

HH.11

	Don't know ....[] 999
	No response ....[] 777
B36. Approximately one year ago, how much did you pay?	*Interviewer: Record price. If participant doesn't know, put 999.*
	___ ___ ___ L.L. per month
	Don't know ....[] 999
	No response ....[] 777
B37. How many heads did they offer you for free?	*Interviewer: record number*
	___ ___ ___
	Don't know ....[] 999
	No response ....[] 777
B38. Which of the following statements best describes your thinking about giving up <u>arguileh</u> smoking?	In the next 30 days ………………… []1
	In the next 6 months ……………….[]2
	In the next year ……………………..[]3
	More than one year from now ...……[]4
	I don't want to quit …………………[]5
	Don't know ....[] 999
	No response ....[] 777
B39. In the past 12 months, have you stopped smoking arguileh for one day or longer because you were trying to quit?	Yes ………………………………...[]1
	No ………………………………[]2
	Don't know ....[] 999
	No response ....[] 777
B40. In your opinion, is it acceptable for females to smoke waterpipe in general?	Yes ………………………………...[]1
	No ………………………………[]2
	Don't know ....[] 999
	No response ....[] 777

Would you consider purchasing any tobacco products (cigarettes, arguileh tobacco, arguileh delivery, arguileh at a café,) at any time in the future?

Yes …………………..[]1

No……….…………...[]2

If the answer is "No" the interviewer should skip the DCE scenarios.

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SECTION C: DISCRETE CHOICE EXPERIMENT

Description:
- In the next section, you will see 8 hypothetical choice scenarios about buying tobacco for yourself, the only difference between the scenarios is the price of the tobacco products

- Each scenario will present you with 8 different tobacco products that you may purchase:

    1. Premium cigarettes like Marlboro, Davidoff, and Gitanes

    2. Discount cigarettes like Byblos, Cedars, and Maestro

    3. Premium mouassal arguileh tobacco (250 g) like Al Fakher, Nakhla, and Mazaya

    4. Discount mouassal arguileh tobacco (250 g) like Ya layl, Al Tamayoz

    5. Ajami arguileh tobacco (250 g) like Al Zaeem, Al Bacha, and Tombac Asfahani

HH.13

6. Home-delivery of prepared arguileh

7. Baladi/sha'bi arguileh cafes

8. Fancy arguileh cafes

- Each of the 8 product categories will have its own price, and the prices change in each scenario.

- You will be asked to imagine yourself buying your needs of arguileh and cigarette smoking products as you would typically in real life, and tell us how many items you would buy.

- You may choose to buy 1 or more items from some types and none (i.e. 0) from others. You may choose to buy nothing at all, in which case the answer will be 0 for all 8 tobacco products.

- Please seriously consider the prices at which each item is being offered when making your decision about the quantities. Make sure that the sum you spend on these products is in line with your budget for buying tobacco. Also, keep in mind that the money you spend on tobacco products will not be available for you to spend on other things.

- Here is an example of a choice scenario:

. Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Ajami	Arguileh home delivery	Arguileh at fancy cafe	Arguileh session at Sha'bi cafe
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	5,000 L.L	1,250 L.L	13,500 L.L	10,250 L.L	20,000 L.L	7,500 L.L	15,000 L.L	7,500 L.L
Quantity	*1*	*0*	*2*	*0*	*0*	*0*	*1*	*2*

Now I leave you to complete the choice scenarios. **[INTERVIEWER: LEAVE THE PARTICIPANT TO FILL IN THE CHOICE SETS]**

VERSION 1

HH.14

C1. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	2, 500 L.L	750 L.L	13, 500 L.L	10, 250 L.L	20, 000 L.L	7, 500 L.L	15, 000 L.L	7, 500 LL
Quantity								

C2. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Arguileh tobacco non-flavored	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	2, 500 L.L	750 L.L	20, 250 L.L	15, 250 L.L	67, 500 L.L	25, 250 L.L	33, 750 L.L	16, 750 L.L
Quantity								

HH.15

C3. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	4, 000 L.L	1, 250 L.L	30, 250 L.L	10, 250 L.L	45, 000 L.L	16, 750 L.L	50, 500 L.L	25, 250 L.L
Quantity								

C4. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	4, 000 L.L	1, 250 L.L	45, 500 L.L	15, 250 L.L	30, 000 L.L	11, 250 L.L	22, 500 L.L	11, 250 L.L
Quantity								

HH.16

C5. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	5, 500 L.L	1, 750 L.L	13, 500 L.L	23, 000 L.L	45, 000 L.L	16, 750 L.L	33, 750 L.L	16, 750 L.L
Enter quantity								

C6. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	5, 500 L.L	1, 750 L.L	20, 250 L.L	34, 500 L.L	30, 000 L.L	11, 250 L.L	15, 000 L.L	7, 500 L.L
Enter quantity								

HH.17

C7. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	8, 000 L.L	2, 500 L.L	30, 250 L.L	23, 000 L.L	20, 000 L.L	7, 500 L.L	22, 500 L.L	11, 250 L.L
Quantity								

C8. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh Café session premium	Waterpipe café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	8, 000 L.L	2, 500 L.L.	45, 500 L.L	34, 500 L.L	67, 500 L.L	25, 250 L.L	50, 500 L.L	25, 250 L.L
Quantity								

HH.18

VERSION 2

C1. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	2, 500 L.L	1, 250 L.L	30, 250 L.L	34, 500 L.L	20, 000 L.L	11, 250 L.L	33, 750 L.L	25, 250 LL
Quantity								

C2. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	2, 500 L.L	1, 250 L.L	45, 500 L.L	23, 000 L.L	67, 500 L.L	16, 750 L.L	15, 000 L.L	11, 250 L.L
Quantity								

HH.19

C3. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	4, 000 L.L	750 L.L	13, 500 L.L	34, 500 L.L	45, 000 L.L	25, 250 L.L	22, 500 L.L	7, 500 L.L
Quantity								

C4. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	4, 000 L.L	1,750 L.L	13, 500 L.L	23, 000 L.L	45, 000 L.L	16, 750 L.L	33, 750 L.L	16, 750 L.L
Quantity								

HH.20

C5. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	5, 500 L.L	2, 500 L.L	30, 250 L.L	15, 250 L.L	45, 000 L.L	25, 250 L.L	15, 000 L.L	11, 250 L.L
Enter quantity								

C6. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	5, 500 L.L	2, 500 L.L	45, 500 L.L	10, 250 L.L	30, 000 L.L	7, 500 L.L	33, 750 L.L	25, 250 L.L
Enter quantity								

HH.21

C7. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	8, 000 L.L	1, 750 L.L	13, 500 L.L	15, 250 L.L	20, 000 L.L	11, 250 L.L	50, 500 L.L	16, 750 L.L
Quantity								

C8. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh Café session premium	Waterpipe café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	8, 000 L.L	1, 750 L.L.	20, 250 L.L	10, 250 L.L	67, 500 L.L	16, 750 L.L	22, 500 L.L	7, 500 L.L
Quantity								

HH.22

VERSION 3

C1. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	2, 500 L.L	1, 750 L.L	13, 500 L.L	23, 000 L.L	30, 000 L.L	25, 250 L.L	22, 500 L.L	25, 250 LL
Quantity								

C2. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	2, 500 L.L	1, 750 L.L	20, 250 L.L	34, 500 L.L	45, 000 L.L	7, 500 L.L	50, 500 L.L	11, 250 L.L
Quantity								

HH.23

C3. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	4, 000 L.L	2, 500 L.L	30, 250 L.L	23, 000 L.L	67, 500 L.L	11, 250 L.L	33, 750 L.L	7, 500 L.L
Quantity								

C4. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	4, 000 L.L	2, 500 L.L	45, 500 L.L	34, 500 L.L	20, 000 L.L	16, 750 L.L	15, 000 L.L	16, 750 L.L
Quantity								

HH.24

C5. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	5, 500 L.L	750 L.L	13, 500 L.L	10, 250 L.L	67, 500 L.L	11, 250 L.L	50, 500 L.L	11, 250 L.L
Enter quantity								

C6. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	5, 500 L.L	750 L.L	20, 250 L.L	15, 250 L.L	20, 000 L.L	16, 750 L.L	22, 500 L.L	25, 250 L.L
Enter quantity								

HH.25

C7. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	8,000 L.L	1, 250 L.L	30, 250 L.L	10, 250 L.L	30, 000 L.L	25, 250 L.L	15, 000 L.L	16, 750 L.L
Quantity								

C8. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh Café session premium	Waterpipe café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	8, 000 L.L	1, 250 L.L.	45, 500 L.L	15, 250 L.L	45, 000 L.L	7, 500 L.L	33, 750 L.L	7, 500 L.L
Quantity								

HH.26

VERSION 4

C1. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

		Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
		Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
	Price	2, 500 L.L	2, 500 L.L	30, 250 L.L	15, 250 L.L	30, 000 L.L	16, 750 L.L	50, 500 L.L	7, 500 LL
	Quantity								

C2. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	2, 500 L.L	2, 500 L.L	45, 500 L.L	10, 250 L.L	45, 000 L.L	11, 250 L.L	22, 500 L.L	16, 750 L.L
Quantity								

HH.27

C3. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	4, 000 L.L	1, 750 L.L	13, 500 L.L	15, 250 L.L	67, 500 L.L	7, 500 L.L	15, 000 L.L	25, 250 L.L
Quantity								

C4. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	4, 000 L.L	1, 750 L.L	20, 250 L.L	10, 250 L.L	20, 000 L.L	25, 250 L.L	33, 750 L.L	11, 250 L.L
Quantity								

C5. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	5, 500 L.L	1, 250 L.L	30, 250 L.L	34, 500 L.L	67, 500 L.L	7, 500 L.L	22, 500 L.L	16, 750 L.L
Enter quantity								

C6. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	5, 500 L.L	1, 250 L.L	45, 500 L.L	23, 000 L.L	20, 000 L.L	25, 250 L.L	50, 500 L.L	7, 500 L.L
Enter quantity								

HH.29

C7. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	8, 000 L.L	750 L.L	13, 500 L.L	34, 500 L.L	30, 000 L.L	16, 750 L.L	33, 750 L.L	11, 250 L.L
Quantity								

C8. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh Café session premium	Waterpipe café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	8, 000 L.L	750 L.L.	20, 250 L.L	23, 000 L.L	45, 000 L.L	11, 250 L.L	15, 000 L.L	25, 250 L.L
Quantity								

For non-smokers only :

Interviewer: Fill this for non-smokers only. Choose the appropriate option.

1- The participant filled out the scenarios

2- The participant partially filled out the scenarios or the interviewer completed the scenarios.

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STROBE Statement—Checklist of items that should be included in reports of *cross-sectional studies*

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	3
Objectives	3	State specific objectives, including any prespecified hypotheses	4
Methods			
Study design	4	Present key elements of study design early in the paper	4
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	4
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	4
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	5
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	*5*
Bias	9	Describe any efforts to address potential sources of bias	5
Study size	10	Explain how the study size was arrived at	4
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	5
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	5
		(*b*) Describe any methods used to examine subgroups and interactions	5
		(*c*) Explain how missing data were addressed	5
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	5
		(*e*) Describe any sensitivity analyses	5
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	4
		(b) Give reasons for non-participation at each stage	
		(c) Consider use of a flow diagram	

Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	5 – 6
		(b) Indicate number of participants with missing data for each variable of interest	
Outcome data	15*	Report numbers of outcome events or summary measures	6-12
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	6-12
		(*b*) Report category boundaries when continuous variables were categorized	p.6 (table 1), p.8 (table 2), p.10 (table 3), p.12 (table 4)
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	p.6 (table 1), p.8 (table 2),
Discussion			
Key results	18	Summarise key results with reference to study objectives	13
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	14
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	13
Generalisability	21	Discuss the generalisability (external validity) of the study results	13
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	15

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

Title: Prevalence of Cigarette and Waterpipe Tobacco Smoking among Adults in Three Eastern Mediterranean Countries: A cross-sectional household survey

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Primary Subject Heading:	Public health
Secondary Subject Heading:	Smoking and tobacco
Keywords:	PUBLIC HEALTH, EPIDEMIOLOGY, Health policy < HEALTH SERVICES ADMINISTRATION & MANAGEMENT

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Title: Prevalence of cigarette and waterpipe tobacco smoking among adults in three Eastern Mediterranean countries: a cross-sectional household survey

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ABSTRACT

Objectives: Tobacco smoking is on the rise in the Eastern Mediterranean region. In light of limited surveillance of smoking in the region, this study sought to understand the prevalence of cigarette and waterpipe smoking among adults and the factors associated with smoking in Lebanon, Jordan, and Palestine (West Bank only).

Design, setting and participants: Household surveys were conducted with participants over the age of 18 in Lebanon (n=1680), Jordan (n=1925) and Palestine (n=1679) between June and August 2019. A multistage cluster sampling approach with probability-proportional-to-size random selection method was followed in the three countries.

Primary and secondary outcome measures: Gender-specific prevalence rates for cigarette and waterpipe smoking were estimated. Multivariable logistic regression was used to examine factors associated with current cigarette and waterpipe tobacco smoking.

Results: The prevalence of cigarette smoking among males and females respectively was 48.6% and 21.5% in Lebanon, 50.4% and 9.1% in Jordan, and 53.4% and 3.1% in Palestine. The prevalence of waterpipe smoking among males and females respectively was 32.7%and 46.2% in Lebanon, 13.4% and 7.8% in Jordan, and 18.0% and 7.9% in Palestine. Cigarette smokers were significantly (p<0.05) more likely to be male, younger, and with lower educational attainment across the three countries. Waterpipe smokers were more likely to be young adults across the three countries (p<0.001). They were more likely to be male in Jordan and Palestine, and more likely to be female in Lebanon.

Conclusions: The high prevalence rates of smoking in Lebanon, Jordan, and Palestine are concerning. Continued surveillance is key to monitor smoking patterns and inform stronger tobacco control measures.

Keywords: cigarette smoking, waterpipe tobacco smoking, smoking prevalence, surveillance

Strengths and Limitations of the study:

- The study reports contemporary estimates of smoking prevalence using large, nationally representative surveys, that have been consistently lacking in previous studies.
- The study used standardized questionnaires across the three countries, allowing for valid cross-country comparisons.
- Tobacco use was self-reported and not biochemically verified and only a small number of females reported current smoking in Jordan and Palestine, which may have underreported prevalence.
- The study did not report on use of other alternative smoking products which are increasingly more available in the loosely regulated markets of those countries.

INTRODUCTION

Smoking is the leading cause of preventable death as well as a main risk factor for cancer, cardiovascular and pulmonary diseases. Although considerable progress has been achieved in curbing the tobacco epidemic in many parts of the world, smoking trends continue to increase in low- and middle-income countries[1]. One notable example has been the Eastern Mediterranean region (EMR) –which the World Health Organization (WHO) has projected the smoking prevalence to increase by 2025[2]. Cigarette smoking is highly prevalent in the EMR, due to weak regulatory environments, insufficient surveillance infrastructure and interference from a strong tobacco industry[3]. The problem is compounded by the wide prevalence of waterpipe tobacco smoking[4]. Waterpipe smoking rates in the region are considered the highest worldwide, with notably high prevalence among young adults[5]. This pattern is attributed to multiple factors, including the perception of waterpipe smoking as a less harmful alternative to cigarette smoking, the café culture encouraging social smoking of the waterpipe, and appeal of flavored waterpipe tobacco[6, 7].

The WHO Framework Convention on Tobacco Control requires parties to collect data on tobacco use and exposure on a regular basis to monitor smoking trends and policy implementation[8]. To date, surveillance of tobacco use among adults in the EMR has been limited. For example, routinely available data from the Global Adult Tobacco Survey (GATS) are only available in Egypt (2009)[9], Qatar (2013)[10] and Pakistan (2014)[11]. Other surveillance efforts in the region have been limited to specific populations, such as youth[12], university students[13, 14], and healthcare professionals [15]. These limitations in the available smoking prevalence data justify the need for detailed national prevalence data on both cigarette and waterpipe smoking among adults in Eastern Mediterranean countries.

In Lebanon, the most recent national estimates for adult cigarette smoking date back to 2013[2] when the prevalence of current cigarette smoking was 34% among males and 19% among females. The national estimates for waterpipe tobacco smoking prevalence (25.3%) date back to 2009, when the prevalence rate was 26.5% among males and 24.3% among females[16]. According to Jordan STEPS 2019 survey, 65.3% of men and 16.4% of women were current smokers of any tobacco products[17]. As for Palestine, the most recent national estimates were from the Palestinian Family Survey in 2010, when the prevalence rate for cigarette smoking was 29.9% among adults (49.7% among men and 3.5% among women)[18].

Given that the most recent national prevalence estimates across the three countries date back to one decade, this study sought to estimate contemporary prevalence rates of current cigarette and waterpipe smoking in Lebanon, Jordan, and Palestine (West Bank only), and their correlates. Further, the issue of dual tobacco use has not been sufficiently explored in studies coming from the region, and as such, this study examined the dual use of cigarette and waterpipe tobacco in these three countries.

METHODS
Data source
We conducted nationally-representative in-person cross-sectional household surveys in Lebanon, Jordan, and Palestine between June and August 2019. Eligible respondents included males and females aged 18 years and older, residing in each of the countries as their primary place of residence, regardless of nationality.

The sample size was calculated to estimate the prevalence of current waterpipe smoking for males and females in each country based on previously reported prevalence rates [2, 19] with a margin of error of 5% if the prevalence rate is more than 10% or with a margin of error of half of the assumed prevalence if it is less than 10%. The average number of individuals or households sampled per cluster and the design effect were taken into consideration. A design effect of 2.0 was used based on the recommendations of the GATS manual. With an 80% power and α=0.05, the minimum number of clusters needed in the countries ranged from 16 to 28 and the number of subjects ranged from 480 to 840 persons. Since one male and one female were to be selected from each household, the largest number of clusters and households (28 clusters and 1680 subjects; 840 men and 840 women) was the sample size for each country.

A multistage cluster sampling approach with probability-proportional-to-size random selection method was followed. In each country, the sample of households was chosen in two stages. First, well-defined clusters were selected within each governorate (i.e., province). Second, housing units were selected within each selected cluster. The sampling frame for clusters was specific to the characteristics of each country. In Lebanon, all eight governorates were selected for sampling: Akkar, Baalbek-Hermel, Bekaa, Beirut, Mount Lebanon, Nabatieh, North Lebanon, and South Lebanon. In Jordan, all 12 governorates were included in the study: Ajloun, Amman, Aqaba, Balqa, Irbid, Jerash, Karak, Ma'an, Madaba, Mafraq, Tafilah, and Zarqa. In Palestine, all 11 governorates of the West Bank were selected: Bethlehem, East Jerusalem, Hebron, Jenin, Qalqilya, Nablus, Ramallah and Al-Bireh, Jericho, Salfit, Tubas, and Tulkarm. The Palestinian governorates in Gaza were excluded due to logistical barriers. The second stage of household selection involved choosing a random sample of 30 households from a complete list of households in a selected area, based on local administrative sources or household lists from the most recent census. One eligible male and one female resident, who consider the site of data collection as their primary place of residence, were selected from each selected household. In Lebanon and Palestine, if an eligible female or male was not available for interview at the time of household visit, additional households were selected until an equal number of males and females was reached. In Jordan, additional households were selected that yielded a higher number of males than females. After eligibility screening, we provided potential respondents with information about the study and asked them to provide verbal consent to participate as per IRB approval. With the exception of aforementioned respondent selection, the same methods and recruitment protocol were used in all three countries.

Data collection

Data were collected using the same structured, Arabic-language questionnaire, with selected questions tailored to local context for each country. In the three countries, the surveys were administered face-to-face by trained interviewers. Prior to data collection, each country team pretested the questionnaires with 10-15 individuals of similar characteristics to that of the survey respondents. Minor amendments to wordings of a few questions were applied. Each country team then piloted with 10-15 individuals before data collection proceeded. No changes following piloting were needed. Data collectors in the three countries were trained on the ethics of data collection, consenting, sampling methodology and on the survey questions, using the same training manual. The training included a review of each questionnaire item, followed by practice sessions which involved role play as interviewer and interviewee which focused on probing to

make sure all interviewees give full answers to ensure that there is no missing data for the analysis. It is important to note that the missing data are minimal (<1%) because of the quality control and assurance procedures implemented.

Measures
Respondents were asked if they had ever tried cigarettes or waterpipe tobacco. Among ever users of each product, respondents were asked if they were current users of the product. Current cigarette smoking was defined as currently smoking cigarettes every day or some days. Similarly, current waterpipe smoking was defined as currently smoking tobacco in a waterpipe every day or some days. Among current cigarette smokers, respondents were asked about the number of cigarettes smoked per day. Dual current smokers included both cigarette and waterpipe smokers while any current smoker included cigarette or waterpipe smokers. Among current waterpipe tobacco smokers, respondents were asked about the number of waterpipe sessions they smoked at home per week, the number of waterpipe sessions they smoked in a café per week, and whether they usually smoked flavored waterpipe tobacco. We assessed the demographic characteristics of respondents, including their sex, age in years, marital status, educational attainment, and household monthly income. The survey instrument can be found as supplementary material.

Statistical analysis
Descriptive statistics were used to summarize the study participants' demographic and socio-economic characteristics. We estimated overall gender-specific prevalence rates of cigarettes and waterpipe smoking and their 95% confidence intervals (CI) within each country. For the purpose of calculation of age-standardized prevalence rates, the WHO World Standard Population which reflects the average age structure of the world's population expected over the next generation, from 2000 to 2025 was used[20]. Multivariable logistic regression analysis was conducted to examine factors associated with current cigarette smoking and current waterpipe smoking in separate models for each country. The independent variables tested in these models included gender (female vs. male), age group in years (18-29, 30-49, 50-64, and 65 or older), educational attainment (primary school or less, middle school, high school/diploma, and university), marital status (ever married vs. never married) and individual monthly income (quartiles within each country). Odds ratios (ORs) and their 95% CIs were estimated from the models. A p-value of less than 0.05 was considered statistically significant. Respondents with missing data on outcome measures or covariates were excluded from models on a case-wise basis. Data were analyzed using Stata statistical software version 16 (StataCorp, College Station, TX).

Patient and Public Involvement
There was no patient public involvement in the design, conduct, reporting, or dissemination plans of our research.

RESULTS
A total of 1,680 respondents in Lebanon, 1,925 in Jordan, and 1,679 in Palestine completed the surveys. The number of non-respondents (rate) was 862 (33.9%) in Lebanon, 74 (3.7%) in Jordan and 141 (7.7%) in Palestine.
 Table 1 presents the characteristics of respondents by gender in each country. Females represented 50.0% of the sample in Lebanon, 44.6% in Jordan and 50.0% in Palestine. Almost

45.1% of respondents in Lebanon, 45.9% of respondents in Jordan, and 41.3% of respondents in Palestine were younger than 50 years old. The majority (80.8%) of respondents in Lebanon, 75% of respondents in Jordan and 81.5% of respondents in Palestine were ever married. Almost one-fifth (20.7%) of respondents in Lebanon, 25.1 % in Jordan, and 16.2 % in Palestine had completed university education.

Table 1. Socio-demographic characteristics by gender and country 2019

Variable	Lebanon		Jordan		Palestine	
	Male (n=840)	Female (n=840)	Male (n=1067)	Female (n=858)	Male (n=839)	Female (n=840)
	(%) n	(%) n	(%) n	(%) n	(%) n	(%) n
Age, in years						
18 – 29	(22.7) 191	(29.3) 246	(26.4) 282	(27.7) 238	(32.9) 276	(25.7) 216
30 – 49	(44.5) 374	(45.7) 384	(45.2) 482	(46.6) 400	(37.8) 317	(44.8) 376
50 – 64	(28.3) 238	(23.2) 195	(19.9) 212	(18.9) 162	(25.4) 213	(28.6) 240
≥65	(4.4) 37	(1.8) 15	(8.5) 91	(6.8) 58	(3.9) 33	(1.0) 8
Marital Status						
Never married	(20.4) 170	(18.1) 153	(25.0) 210	(12.1) 102	(22.1) 185	(8.2) 69
Ever married	(79.8) 670	(81.8) 687	(75.0) 629	(75.0) 738	(75.0) 629	(87.9) 738
Education						
Primary school or less	(17.4)146	(11.9) 100	(22.3) 238	(24.0) 206	(44.3) 372	(50.4) 423
Middle school	(21.7) 182	(21.3) 179	(41.1) 439	(36.6) 314	(33.7) 283	(25.8) 217
High school/diploma	(40.0) 336	(46.4) 390	(12.0) 128	(13.9) 119	(7.5) 63	(5.9) 50
University	(21.0) 176	(20.4) 171	(24.6) 262	(25.5) 219	(14.4) 121	(17.9) 150
Monthly Income*						
Quartile 1	(7.51) 62	(9.1) 75	(21.7) 227	(24.9) 207	(21.2) 174	(26.6) 214
Quartile 2	(39.5) 326	(38.8) 321	(39.4) 411	(38.5) 320	(41.9) 344	(44.0) 355
Quartile 3	(39.1) 323	(38.7) 320	(25.1) 262	(23.7) 197	(19.8) 163	(16.5) 133
Quartile 4	(13.9) 115	(13.4) 111	(13.8) 144	(12.9) 107	(17.0) 140	(12.9) 104
No income	(1.7) 14	(1.6) 13	(2.2) 23	(3.2) 27	(2.2) 18	(4.0) 34

*Income quartile levels: **Lebanon:** [1] <$529.88; [2] $529.88 - < $993.53; [3] $993.53 - < $1,987.05; [4] ≥ $1,987.05. **Jordan:** [1] < $423.13; [2] $423.13 = < $705.22; [3] $705.22 - < $1,269.39. **Palestine:** [1] < $610.04; $610.04 - < $1,067.57; [3] $1,067.57 - < $1,525.10; [4] ≥ 1,525.10.

Prevalence of cigarette and waterpipe tobacco smoking

Table 2 shows the crude and age-standardized prevalence rates of current cigarette smoking, current waterpipe smoking, dual smoking and any smoking, by country. Overall, the crude prevalence rate (95% CI) for current cigarette smoking was 35.1% (32.8, 37.4) in Lebanon, 32.0% (29.9, 34.1) in Jordan and 28.2% (26.1, 30.5) in Palestine. The prevalence rate for current waterpipe smoking was 39.5% (37.1, 41.8) in Lebanon, 11.0% (9.6, 12.4) in Jordan, and 12.9% (11.4, 14.6) in Palestine. The overall rate for dual current smoking was 3.6% (2.8, 4.6) in

Lebanon, 2.8% (2.1, 3.6) in Jordan, and 4.4% (3.5, 5.5) in Palestine. As for any current smoking, the prevalence rate was 70.9% (68.7, 73.1) in Lebanon, 40.2% (38.0, 42.4) in Jordan, and 36.7% (34.4, 39.1) in Palestine. Respectively, the age standardized prevalence rates of current cigarette and waterpipe smoking were 27.8% and 38.1% in Lebanon, 25.5% and 12.0% in Jordan, and 26.3% and 14.1% in Palestine.

Table 2. Crude and age-standardized prevalence rates (ASR) and their 95% confidence intervals (CI) of current cigarette smoking, current waterpipe smoking, dual smoking, and any smoking in Lebanon, Jordan, and Palestine, 2019.

Country/ gender	Current cigarette smoking		Current waterpipe smoking		Dual smoking		Any Smoking	
	Crude (95% CI)	ASR (95% CI)	Crude (95% CI)	ASR (95% CI)	Crude (95% CI)	ASR (95% CI)	Crude (95% CI)	ASR (95% CI)
Lebanon								
Male	48.6 (45.1, 52.0)	38.6 (30.9, 46.4)	32.7 (29.6, 36.0)	35.6 (26.4, 44.7)	5.5 (4.0, 7.2)	5.8 (2.1, 9.6)	75.8 (72.8, 78.7)	68.4 (57.0, 79.8)
Female	21.5 (18.8, 24.5)	15.9 (11.3, 20.5)	46.2 (42.8, 49.6)	39.8 (29.4, 50.3)	1.8 (1.0, 2.9)	0.9 (0.4, 1.3)	66.0 (62.6, 69.2)	54.9 (43.5, 66.3)
Total	35.1 (32.8, 37.4)	27.8 (22.9, 32.6)	39.5 (37.1, 41.8)	38.1 (31.2, 44.9)	3.6 (2.8, 4.6)	3.6 (1.4, 5.7)	70.9 (68.7, 73.1)	62.3 (54.1, 70.4)
Jordan								
Male	50.4 (47.4, 53.5)	39.7 (32.9, 46.4)	13.5 (11.5, 15.7)	15.1 (9.4, 20.7)	4.3 (3.2, 5.7)	4.6 (1.6, 7.6)	59.6 (56.6, 62.6)	50.1 (41.9, 58.3)
Female	9.1 (7.3, 11.2)	8.0 (4.2, 11.8)	7.8 (6.1, 9.8)	8.3 (3.8, 12.9)	0.8 (0.3, 1.7)	0.5 (0.1, 0.9)	16.1 (13.7, 18.7)	15.9 (10.0, 21.8)
Total	32.0 (29.9, 34.1)	25.5 (21.4, 29.6)	11.0 (9.6, 12.4)	12.0 (8.3, 15.7)	2.8 (2.1, 3.6)	2.8 (1.1, 4.4)	40.2 (38.0, 42.4)	34.8 (29.6, 40.0)
Palestine								
Male	53.4 (50.0, 56.8)	45.0 (37.5, 52.6)	18.0 (15.5, 20.8)	16.6 (11.5, 21.7)	8.0 (6.2, 10.0)	6.4 (3.5, 9.2)	63.4 (60.0, 66.7)	55.3 (46.6, 63.9)
Female	3.1 (2.0, 4.5)	1.6 (1.0, 2.3)	7.9 (6.1, 9.9)	12.2 (4.6, 19.9)	0.8 (0.3, 1.7)	0.5 (0.1, 0.9)	10.1 (8.2, 12.4)	13.4 (5.7, 21.0)
Total	28.2 (26.1, 30.5)	26.3 (21.2, 31.4)	12.9 (11.4, 14.6)	14.1 (9.9, 18.2)	4.4 (3.5, 5.5)	3.8 (2.0, 5.7)	36.7 (34.4, 39.1)	36.5 (30.3, 42.8)

Patterns of cigarette and waterpipe smoking

Table 3 presents the patterns of cigarette and waterpipe smoking among current smokers according to gender and country. In Lebanon, almost half of current cigarette smokers reported smoking ≥20 cigarettes per day (42.6% of males and 51.9% of females). In Jordan, more than half of male current cigarette smokers (52.0%) and one third of female cigarette smokers (33.3%) reported smoking ≥20 cigarettes per day. In Palestine, among those who currently smoke cigarettes, 37.5% of males and 3.8% of females reported smoking ≥20 cigarettes per day.

The majority of waterpipe smokers in Lebanon used flavored tobacco (86.2% of males and 89.2% of females), smoked more than 3 sessions at home (92.5% of males and 86.9% of females) and smoked three sessions or less per week in a café (90.0% of males and 96.3% of females). In Jordan, the majority of waterpipe smokers used flavored tobacco (92.3% of males and 98.5% of females), the majority of male respondents (70.5%) and less than half of females

(46.9%) smoked more than three waterpipe sessions at home, and the majority of respondents smoked three sessions or less per week in a café (62.9% of males and 85.7% of females). In Palestine, the majority of waterpipe smokers used flavored tobacco (94.6% of males and 93.9% of females), 85.7% of males and 95.4% of females smoked more than 3 sessions of waterpipe at home, and 97.7% of males and 95.5% of females smoked three sessions or less per week in a café.

Table 3. Patterns of cigarette and waterpipe smoking among current smokers according to gender by country in 2019

Variable	Lebanon		Jordan		Palestine	
	Males	Females	Males	Females	Males	Females
	(%) n	(%) n	(%) n	(%) n	(%) n	(%) n
Cigarettes per day						
<10	(35.0) 143	(34.8) 63	(3.4) 18	(18.0) 14	(9.4) 42	(23.1) 6
10 – 20	(42.6) 174	(51.9) 94	(44.6) 240	(48.7) 38	(53.1) 238	(73.1) 19
>20	(22.3) 91	(13.3) 24	(52.0) 280	(33.3) 26	(37.5) 168	(3.8) 1
Total	(100.0) 408	(100.0) 181	(100.0) 538	(100.0) 78	(100.0) 448	(100.0) 26
Waterpipe sessions at home, per week						
≤3	(7.5) 19	(13.1) 49	(29.5) 33	(53.1) 34	(85.7) 108	(95.4) 62
>3	(92.5) 234	(86.9) 326	(70.5) 79	(46.9) 30	(14.3) 18	(4.6) 3
Waterpipe sessions at café, per week						
≤3	(90.9) 180	(96.3) 236	(62.9) 22	(85.7) 6	(97.7) 85	(95.5) 21
>3	(9.1) 18	(3.7) 9	(37.1) 13	(14.3) 1	(2.3) 2	(4.5) 1
Type of waterpipe tobacco smoked						
Flavored	(86.2) 237	(89.2) 346	(92.3) 132	(98.5) 66	(94.6) 141	(93.9) 62
Non-flavored	(13.8) 38	(10.8) 42	(7.7) 11	(1.5) 1	(5.4) 8	(6.1) 4

Factors associated with current cigarette smoking

Table 4 presents the results of the multivariable analysis of factors associated with current cigarette smoking by country and the adjusted odds ratio. In Lebanon, males were more likely than females to be current cigarette smokers (OR: 5.07; 95% CI: 3.73, 6.89). Compared with young adults 18-29 years old, respondents who were older were more likely to be current smokers: (OR: 5.52; 95% CI: 3.22, 9.49) among those 30-49 years old, (OR: 6.34; 95% CI: 3.57, 11.26) among adults 50-64 years old, and (OR: 2.84; 95% CI: 1.15, 7.05) among adults ≥65 years old. Compared with adults who had a primary school education or less, adults with a high school education (OR: 0.44; 95% CI: 0.27, 0.72) and those with a university education (0.52; 95% CI: 0.29, 0.92) were significantly less likely to be current cigarette smokers.

In Jordan, males were significantly more likely than females to be current cigarette smokers (OR: 13.77; 95% CI: 9.29, 20.44). Adults ≥65 years old were less likely than those 18-29 years old to be current cigarette smokers (OR: 0.35; 95% CI: 0.19, 0.65). Compared with adults who had a primary school education or less, adults with a high school education (OR: 0.61; 95% CI: 0.38, 0.97) and those with a university education (OR: 0.61; 95% CI: 0.41, 0.91) were less likely to be current cigarette smokers. In addition, adults in the highest income quartile were significantly more likely to be current smokers compared with adults in the lowest income quartile (OR: 1.68; 95% CI: 1.05, 2.69).

Finally, in Palestine, males were also significantly more likely than females to be current cigarette smokers (OR: 66.95; 95% CI: 29.28, 153.10). Adults ≥65 years old were less likely than those 18-29 years old to be cigarette smokers (OR: 0.33; 95% CI: 0.12, 0.88). Compared to adults with a primary school education or less, adults with a middle school education (OR: 0.58; 95% CI: 0.39, 0.84) and those with a university education (OR: 0.57; 95% CI: 0.35, 0.93) were significantly less likely to be current cigarette smokers.

Table 4. Multivariable analysis of factors associated with current cigarette smoking among adults by country in 2019

Variable	Lebanon		Jordan		Palestine	
	Adjusted OR (95% CI)	**p**	**Adjusted OR (95% CI)**	**p**	**Adjusted OR (95% CI)**	**p**
Gender						
Female	reference		reference		reference	
Male	5.07 (3.73, 6.89)	<0.001	13.77 (9.29, 20.44)	<0.001	66.95 (29.28, 153.10)	<0.001
Age, in years						
18 – 29	reference		reference		reference	
30 – 49	5.52 (3.22, 9.49)	<0.001	1.06 (0.77, 1.54)	0.76	1.43 (0.89, 2.27)	0.13
50 – 64	6.34 (3.57, 11.26)	<0.001	0.89 (0.57, 1.37)	0.59	1.64 (0.38, 1.05)	0.08
≥65	2.84 (1.15, 7.05)	0.024	0.35 (0.19, 0.65)	0.001	0.33 (0.12, 0.88)	0.03
Education						
Primary school or less	reference		reference		reference	
Middle school	0.94 (0.58, 1.52)	0.79	0.83 (0.59, 1.17)	0.31	0.58 (0.39, 0.84)	<0.001
High school/diploma	0.44 (0.27, 0.72)	0.001	0.61 (0.38, 0.97)	0.04	0.68 (0.37, 1.26)	0.22

University	0.52 (0.29, 0.92)	0.02	0.61 (0.41, 0.91)	0.02	0.57 (0.35, 0.93)	0.03
Marital Status						
Not Married	reference		reference		reference	
Married	0.61 (0.36, 1.02)	0.06	1.18 (0.83, 1.67)	0.35	1.12 (0.69, 1.80)	0.64
Monthly Income*						
Quartile 1	reference		reference		reference	
Quartile 2	1.09 (0.60, 2.01)	0.77	1.42 (1.00, 2.03)	0.05	0.83 (0.54,1.26)	0.37
Quartile 3	1.06 (0.56, 2.00)	0.87	1.46 (0.99, 2.15)	0.06	1.17 (0.71, 1.93)	0.54
Quartile 4	1.61 (0.76, 3.40)	0.21	1.68 (1.05, 2.69)	0.03	0.62 (0.36, 1.06)	0.08
No income	1.54 (0.44, 5.40)	0.50	0.98 (0.41, 2.36)	0.96	0.37 (0.12, 1.21)	0.10

*Income quartile levels: **Lebanon:** [1] <$529.88; [2] $529.88 - < $993.53; [3] $993.53 - < $1,987.05; [4] ≥ $1,987.05. **Jordan:** [1] < $423.13; [2] $423.13 = < $705.22; [3] $705.22 - < $1,269.39. **Palestine:** [1] < $610.04; $610.04 - < $1,067.57; [3] $1,067.57 - < $1,525.10; [4] ≥ 1,525.10.

Factors associated with current waterpipe tobacco smoking

Table 5 presents the results of multivariable analysis of factors associated with current waterpipe tobacco smoking by country and the adjusted odds ratio. In Lebanon, males were less likely than females to be current waterpipe smokers (OR: 0.49; 95% CI: 0.37, 0.64). In addition, adults older than 18-29 years old were less likely to be current waterpipe smokers: (OR: 0.30; 95% CI: 0.18, 0.49) among 30-49 years old, (OR: 0.08; 95% CI: 0.04, 0.15) among 50-64 years old, and (OR: 0.03; 95% CI: 0.01, 0.14). Compared to adults with a primary school education or less, adults with a high school education were more likely to be waterpipe smokers (OR: 1.87; 95% CI: 1.05, 3.34). Compared with adults in the lowest income quartile, those in the second (OR: 2.50; 95% CI: 1.19, 5.26) and third (OR: 2.45; 95% CI: 1.13, 5.30) quartiles were more likely to be current waterpipe smokers.

In Jordan, males were more likely than females to be current waterpipe smokers (OR: 1.92; 95% CI: 1.40, 2.62). Compared with adults 18-29 years old, older adults were less likely to be waterpipe smokers: (OR: 0.66; 95% CI: 0.44, 0.99) among those 30-49 years old, (OR: 0.45; 95% CI: 0.27, 0.75) among those 50-64 years old, and (OR: 0.07; 95% CI: 0.02, 0.31) among those ≥65 years old.

Similarly, in Palestine, males were more likely than females to be current waterpipe smokers (OR: 2.69; 95% CI: 1.85, 3.92). Compared with adults 18-29 years old, older adults were less likely to be waterpipe smokers: (OR: 0.48; 95% CI: 0.30, 0.77) among adults 30-49 years old, (OR: 0.19; 95% CI: 0.09, 0.35) among adults 50-64 years old, and (OR: 0.19; 95% CI: 0.05, 0.77) among adults ≥65 years old.

Table 5. Multivariable analysis of factors associated with current waterpipe smoking among adults by country in 2019

Variable	Lebanon		Jordan		Palestine	
	Adjusted OR (95% CI)	**p**	**Adjusted OR (95% CI)**	**p**	**Adjusted OR (95% CI)**	**p**
Gender						

Female	reference		reference		reference	
Male	0.49 (0.37, 0.64)	<0.001	1.92 (1.40, 2.62)	<0.001	2.69 (1.85, 3.92)	<0.001
Age, in years						
18 – 29	reference		reference		reference	
30 – 49	0.30 (0.18, 0.49)	<0.001	0.66 (0.44, 0.99)	0.04	0.48 (0.30, 0.77)	0.002
50 – 64	0.08 (0.04, 0.15)	<0.001	0.45 (0.27, 0.75)	0.02	0.19 (0.09, 0.35)	<0.001
≥65	0.03 (0.01, 0.14)	<0.001	0.07 (0.02, 0.31)	<0.001	0.19 (0.05, 0.77)	0.02
Education						
Primary school or less	reference		reference		reference	
Middle school	1.03 (0.58, 1.86)	0.91	1.34 (0.87, 2.08)	0.18	1.37 (0.90, 2.10)	0.14
High school/diploma	1.87 (1.05, 3.34)	0.03	1.14 (0.64, 2.02)	0.65	1.72 (0.84, 3.51)	0.14
University	1.90 (0.98, 3.69)	0.06	1.19 (0.73, 1.95)	0.47	1.26 (0.75, 2.13)	0.39
Marital Status						
Not Married	reference		reference		reference	
Married	1.54 (0.91, 2.63)	0.11	1.06 (0.71, 1.58)	0.76	0.66 (0.41, 1.06)	0.08
Monthly Income*						
Quartile 1	reference		reference		reference	
Quartile 2	2.50 (1.19, 5.26)	0.02	0.75 (0.49, 1.14)	0.18	0.71 (0.43, 1.18)	0.18
Quartile 3	2.45 (1.13, 5.30)	0.02	1.05 (0.67, 1.66)	0.82	0.89 (0.49, 1.61)	0.50
Quartile 4	1.93 (0.79, 4.74)	0.15	1.44 (0.87, 2.37)	0.16	1.20 (0.66, 2.20)	0.66
No income	1.27 (0.28, 5.84)	0.76	1.01 (0.37, 2.75)	0.98	0.72 (0.22, 2.37)	0.22

*Income quartile levels: **Lebanon:** [1] <$529.88; [2] $529.88 - < $993.53; [3] $993.53 - < $1,987.05; [4] ≥ $1,987.05. **Jordan:** [1] < $423.13; [2] $423.13 = < $705.22; [3] $705.22 - < $1,269.39. **Palestine:** [1] < $610.04; $610.04 - < $1,067.57; [3] $1,067.57 - < $1,525.10; [4] ≥ 1,525.10.

DISCUSSION

This study provides contemporary estimates of the prevalence and patterns of cigarette and waterpipe smoking among adults in Lebanon, Jordan and Palestine using nationally representative surveys. Findings from the study raise renewed concerns over tobacco use in these countries, which have some of the highest smoking prevalence rates globally: more than two in three adults in Lebanon are current smokers of combustible tobacco products, and almost two-thirds of adult males in Jordan and Palestine are also current smokers. Generally, males were more likely to be current smokers than females. However, almost half of adult females were current waterpipe smokers in Lebanon, exceeding by 40% the prevalence among adult males in that country.

Our study showed comparable results to previously reported prevalence estimates of current cigarette smoking in Lebanon. We report slightly higher estimates for males and females compared to the most recent published estimates where the rates of current cigarette smoking for males and females was 34% and 19%, respectively[2]. As for waterpipe tobacco smoking, our study reports a higher prevalence particularly among females when compared to the latest reported rate of 24.3%[16]. This may be partially explained by the fact that waterpipe smoking is

increasingly becoming a socially normative behavior and remains poorly unregulated, widely available and affordable in Lebanon[21].

In Jordan, our prevalence estimate of current smoking of any tobacco products among men (50.1%) was lower than the previously reported rate (65.3%) in the STEP 2019. Among Jordanian women, our estimate (15.9%) was consistent with the STEP 2019 estimate (16.4%). [17]. In Palestine, adult prevalence estimates of cigarette smoking among males were markedly higher than previously reported estimates of 49.7%, while for females it was relatively similar, 3.5%[18]. We compare here our findings with previously reported prevalence rates in the three countries, bearing in mind that the methodologies of cited studies might not be comparable[2, 16-18, 21].

The gender- and age-specific prevalence rates of cigarette and waterpipe tobacco smoking are generally consistent with previous findings in the three countries[3]. Females in Lebanon had the highest prevalence of waterpipe smoking whereas males in Palestine had the highest prevalence of cigarette smoking across the three countries. Young adults across all three countries were more likely to smoke waterpipe tobacco in line with previous reports that waterpipe smoking has become widespread among young adults which is also consistent with reported global trends[4, 14, 22, 23]. This may be attributable to the fact that waterpipe smoking is widely perceived to be less harmful than cigarette smoking among young people[6].

Patterns of smoking were different among current cigarette smokers across the three countries. More than one-third of males and females in Lebanon were light smokers, averaging less than ten cigarettes per day. In contrast, only 3.4% of males and 18.0% of females who were current cigarette smokers in Jordan were light smokers. Similarly, in Palestine, 9.4% of males and 23.1% of females were light smokers. These patterns, combined with the high overall prevalence rates of cigarette smoking, may be suggestive that for a significant proportion of smokers, cigarette smoking may be regarded more as a social behavior, especially in Lebanon. Alternatively, almost all male smokers in Jordan were heavy smokers, suggesting higher levels of addiction, with relevant implications for improving the use of existing smoking cessation services in Jordan. [22].

Finally, it is important to highlight that across all three countries, the overwhelmingly majority of current waterpipe smokers use flavored tobacco, as previously reported in other countries in the EMR. In a study by Hamadeh et al (2021), out of the 2470 students that participated in the study from Egypt, Jordan, Palestine and the United Arab Emirates, the majority of male and female students smoked flavored waterpipe tobacco[24]. This was also observed in Iran where 56% of smokers used flavored waterpipe tobacco[25]. This pattern may be attributed to increased availability of flavored tobacco products, affordability, their unregulated marketing, as well as poor and often misleading labeling [5] calling for the need to consider banning of flavoring in tobacco as a potentially strong regulatory measure[26].

Strengths of this study include the fact that it reports contemporary estimates of smoking prevalence using large, nationally representative surveys, that have been consistently lacking in previous studies. The study used standardized questionnaires across the three countries, allowing for valid cross-country comparisons. Study limitations include the fact that tobacco use was self-reported and not biochemically verified, which may underreport prevalence. In addition, only a

small number of females reported current smoking in Jordan and Palestine. These small sample sizes may have resulted in unreliable estimates of the detailed patterns of cigarette and waterpipe smoking reported for females in the two countries. The study also did not report on use of other alternative smoking products such as electronic cigarettes[17, 27], heated tobacco, and midwakh [28, 29], which are increasingly more available in the loosely regulated markets of those countries.

CONCLUSION

The prevalence of tobacco smoking is alarmingly high in Lebanon, Jordan, and Palestine. The age standardized prevalence rates of current cigarette and waterpipe smoking were 27.8% and 38.1% in Lebanon, 25.5% and 12.0% in Jordan, and 26.3% and 14.1% in Palestine. These high estimates highlight the immediate need to strengthen existing tobacco control policies, especially those that address waterpipe tobacco smoking. Regulations should address waterpipe tobacco smoking in relation to all articles of the FCTC and should also be informed by the body of research in Lebanon, Jordan, and Palestine evaluating waterpipe specific interventions. This should be coupled with regular monitoring of tobacco trends using surveillance data such as the ones reported in this study in order to evaluate progress at national level. Findings from this research provide policy makers with evidence that can support them in calling for improved policies and measures to curb tobacco use.

Contributors

YK led the study design. RN, YK, and NAR monitored data collection. YK, MJ and AC were responsible for data analysis. RN, RA, and RS wrote the first draft. YK, AC, NAR, MJ, AM, and JL contributed to successive drafts. All authors approved the final manuscript.

Ethics approval

This study involves human participants and was approved by the Institutional Board at the American University of Beirut, ID: SBS-2019-0097.

Conflict of Interests

None declared.

Data Availability Statement

Data are available upon reasonable request.

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ECON-WTS 2018

HOUSEHOLD QUESTIONNAIRE
Survey on the Economics of Waterpipe Smoking in Lebanon

HOUSEHOLD INFORMATION PANEL	
HH1. Cluster number: ___ ___ ___	**HH2**. Household number: ___ ___
HH3. Interviewer's name: Name _____ ID number: ___ ___	**HH4**. Supervisor's name: Name_____
HH5. Day / Month / Year of interview: ___ ___ /___ ___ /___ ___ ___ ___ **HH6A**. LOCALITY NAME: _____	**HH6B**. *Governorate:* BEIRUT: ………………………………………………[]1 MOUNT LEBANON: ………………………………[]2 NORTH: ……………………………………………[]3 AKKAR: ……………………………………………[]4 BEKAA: ……………………………………………[]5 SOUTH: ……………………………………………[]6 EL NABATIEH: ……………………………………[]7 BAALBEK-EL HERMEL:……………………………[]8
HH7. Respondent number: ___ ___ ___	

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SECTION A: BACKGROUND CHARACTERISTICS

A1.	Gender	*Interviewer: State gender at sight.* Male............[] 1 Female........[] 2
A2.	What is your age?	___ ___ ___ Years *If the respondent is not sure, the respondent will estimate the age* *Interviewer: round to the nearest integer if necessary.*
A3.	What is your marital status?	Single...........................[] 1 Engaged.......................[] 2 Married........................[] 3 Separated.....................[] 4 Divorced......................[] 5 Widow(er)....................[] 6 No response..................[] 777
A4.	What is the highest education level you have obtained?	*Interviewer: participant can choose one item only:* No formal education................................[] 1 Completed primary school........................[] 2 Completed middle school......................[] 3 Completed high school/equivalent education..[] 4 Completed 1-2-year post-secondary/vocational……………...…......[] 5 Completed university/college.................[] 6 Completed postgraduate degree………...[] 7 Don't know...[] 999 No response...[]777

A5.	What is your nationality?	*Interviewer: participant can choose more than one nationality* Lebanese ……………..…………..[] 1 Syrian ………………………………[]2 Palestinian ………………,………[]3 Other: _____ …,.. []4
A6.	Which of the following best describe your employment status?	*Interviewer: Participant can choose all that apply* Full-time employed in the workforce (including self-employed)......................[] 1 Part-time employed in the workforce (including self-employed)......................[] 2 Unemployed...[] 3 Retired or on a pension............................[] 4 Full-time student....................................[] 5 Part-time student....................................[] 6 Housewife/ Home duties........................[] 7 Other (specify)_____..........[] 8 Don't know...[] 999 No response..[] 777
A7.	What is the best estimate of your **monthly household income**, that is, total income before taxes, or gross income, of all persons in your household combined. We ask this for statistical purposes. We assure your responses will remain strictly confidential.	Less than 800,000 L.L ....[] 1 From 800,000 L.L to less than 1,500,000 L.L....[] 2 From 1,500,000L.L to less than 3,000,000L.L ..[] 3 3,000,000 L.L and more.................................[] 4 Don't know...[] 999 No response...[] 777
A8.	What is the best estimate of your **monthly individual income**, that is, your total income before taxes, or gross income. We ask this for statistical purposes. We assure your responses will remain strictly confidential.	Less than 800,000 L.L ....[] 1 From 800,000 L.L to less than 1,500,000 L.L....[] 2 From 1,500,000L.L to less than 3,000,000L.L ..[] 3 3,000,000 L.L and more.................................[] 4 No income …………………………….....[]5 Don't know...[] 999

HH.3

		No response...[] 777
A9.	In the last month, did you or anyone else in the household had to borrow money to pay any important bills on time, such as electricity, telephone or rent bills?	Yes......................[] 1 No......................[] 2 Don't know……[] 999 No response…...[] 777
A10.	Who usually makes the decisions regarding the daily household purchases? Daily household purchases include grocery or daily essentials etc..	Nobody …………………………….[]1 Respondent alone ……………………..[]2 Respondent and spouse/partner ……..[]3 Respondent and other person …………[]4 Spouse /partner alone …………..….……[]5 Someone else. Specify:_____……[]6 Don't know……………………………[] 999 No response………………………….....[] 777
A11.	Who usually makes the decisions regarding the large household purchases? Large household purchases include furniture or a car etc…	Nobody …………………………….[]1 Respondent alone ……………………..[]2 Respondent and spouse/partner ..……..[]3 Respondent and other person …………[]4 Spouse/partner alone ……………..…….[]5 Someone else. Specify:_____……[]6 Don't know……………………………[] 999 No response………………………….....[] 777

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SECTION B: TOBACCO SMOKING

Tobacco Products

B1.	Do you currently use any tobacco products (cigarettes, arguileh, other tobacco products)?	Yes ………………………[]1 No ………………………[]2 **If answer is "no", skip question B2-B35**
B2.	On average, how many of the following products do you **currently** smoke each (day/week/month)? (One option)	*Interviewer: if respondent reports smoking the product but not every (day/week/month), enter 888* **Regular Cigarettes?** ___ ___ ___ per day ___ ___ ___ per week ___ ___ ___ per month **Number of arguileh sessions at home or someone else's home?** ___ ___ ___ per day ___ ___ ___ per week ___ ___ ___ per month **Number of arguileh sessions in a café or restaurant?** ___ ___ ___ per day ___ ___ ___ per week ___ ___ ___ per month **Do you smoke any other tobacco products?** Yes …………………..[]1 No ……………………[]2 If yes, specify:

	Every day	Some days	Not at all
E-cigarettes			
Cigars			
Chewing Tobacco			

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		Midwakh/ Dokha			
		Roll your own cigarettes			
		Other. Specify _____			

B3.	Are you aware of an increase in the price of tobacco products recently?	Yes ………………………….. []1 No ……………………………[]2 Specify: Cigarettes Waterpipe tobacco Both

B4.	If yes, please report the before and after price of the products that you usually purchase				
		Product	*Unit*	*Price Before*	*Price After*
		Cigarettes	*Pack*		
		Waterpipe tobacco products	*Select unit: 50 g, 100g, 250g, 500g, 1kg*		

B5.	Did the price change affect your purchase patterns?	Yes ………………………….. []1 No ……………………………[]2

B6.	If yes, did it:	Increase your purchase patterns …….. []1 Decrease your purchase patterns ……..[]2

Regular Cigarettes		

B7.	Have you smoked at least 100 cigarettes in your entire life?	Yes ....[] 1 No...[] 2 Don't know ....[] 999 No response ....[] 777 **If answer is "no", skip question B4.**

B8.	Do you <u>now</u> smoke cigarettes?	Every day...[] 1 Some days ....[] 2 Not at all ....[] 3 Don't know ....[] 999 No response ....[] 777 **If the answer is "every day" or "somedays", skip question B5.**
B9.	Do you think you might smoke cigarettes, even once, over the next year?	Definitely yes ………………………. []1 Probably yes …………………………[]2 Probably no …………………………..[]3 Definitely no …………………….....[]4 **If answer is "probably no" or definitely no", skip questions B6 – B10**
B10.	The last time you bought cigarettes for yourself, how many cigarette packs did you buy?	*Interviewer: record number /check unit* ___ ___ ___ Packs..[] 2 Carton...[] 3 Other (specify): _____.....[] 4 Never bought cigarettes ....[] 5 If answer is "never bought cigarettes", skip questions B7-B10
B11.	In total, how much money did you pay for the last purchase?	*Interviewer: if participant doesn't know, enter 999* ___ ___ ___ L.L.
B12.	What was the cigarette pack brand name?	*Interviewer: record brand name* _____
B13.	Which of the following statements best describes your thinking about giving up <u>cigarette</u> smoking?	In the next 30 days ………………… []1 In the next 6 months ………………..[]2 In the next year ……………………..[]3 More than one year from now ...………[]4 I don't want to quit …………………[]5 Don't know ....[] 999 No response ....[] 777

HH.7

B14.	In the past 12 months, have you stopped smoking cigarettes for one day or longer because you were trying to quit?	Yes …………………………………...[]1 No ………………………………[]2 Don't know ....[] 999 No response ....[] 777
Arguileh		
B15.	Have you <u>ever</u> smoked tobacco in a arguileh even just a few puffs?	Yes ....[] 1 No..[] 2 Don't know ....[] 999 No response ....[] 777 **If answer is "no", skip question B12**
B16.	Do you <u>now</u> smoke tobacco in a waterpipe?	Every day..[] 1 Some days ....[] 2 Not at all ....[] 3 Don't know ....[] 999 No response ....[] 777 **If answer is "everyday" or "somedays" skip question B13.**
B17.	Do you think you might smoke waterpipe, even once, over the next year?	Definitely yes …………………………. []1 Probably yes …………………………[]2 Probably not …………………….……[]3 Definitely not …………………….....[]4 **If answer is "probably not" or "definitely not", skip questions B14 - B35**
B18.	What flavor do you mostly prefer smoking?	Non-flavored ………………………….[]1 Flavored. Insert flavor: _____ .…[]2
B19.	The last time you smoked arguileh at a café/restaurant, how many arguileh smoking heads/rocks did you have and how much did you pay for these heads/rocks?	*Interviewer: record number and prices* Number:___ ___ ___ Price: ___ ___ ___ **If quantity is zero "0", skip questions B16- B22**

B20.	The last time you smoked arguileh at a café/restaurant, how much did you pay?	*Interviewer: if participant doesn't know, enter 999* Record Price: ___ ___ ___ L.L.
B21.	How many heads/rocks did they offer you for free?	*Interviewer: Record number* ___ ___ ___ *Don't know* ....*[] 999* *No response* ....*[] 777*
B22.	Think of the last time you smoked arguileh at a café. Which of the following best describes the type of establishment?	Café …………………………..[]1 Baladi/ Sha'bi Café ………….[]2 Internet café……………….….[]3 Restaurant …………………..…[]4 Other _____ ………[]5
B23.	Does the establishment typically serve women?	Yes………………………….…[] 1 No …………………………….[] 2 Don't know ....[] 999 No response ....[] 777

B24.	Approximately one year ago, how many arguileh smoking heads/rocks did you smoke during a typical arguileh cafe visit each month and how much did you pay for these heads/rocks per month?	*Interviewer: record number and prices if participant doesn't know the price, put 999*
		  Number:___ ___ ___ per month
		  Price: :___ ___ ___ per month
		Don't know ....[] 999
		No response ....[] 777

B25.	Approximately one year ago, how much did you pay at a typical arguileh café visit each month?	*Interviewer: Record price* ___ ___ ___ L.L. per month Don't know ....[] 999 No response ....[] 777
B26.	How many heads did they offer you for free?	*Interviewer: Record number* ___ ___ ___ *Don't know* ....*[] 999* *No response* ....*[] 777*

B27. The last time you bought arguileh tobacco pack for yourself from the store, how much arguileh tobacco did you buy?	*Interviewer: record number and check unit* ___ ___ ___ 50 gram packs........................[] 1 ___ ___ ___ 100 gram packs.......................[] 2 ___ ___ ___ 250 gram packs.......................[] 3 ___ ___ ___ 500 gram packs.......................[] 4 ___ ___ ___ 1 kilogram packs.....................[] 5 ___ ___ ___ Other pack - specify weight:__.[] 6 ___ ___ ___ Bulk - specify weight: ____...[] 7 Never bought arguileh tobacco from store ….[]8 **If the answer is "Never bought arguileh tobacco" skip questions B24 – B27**
B28. In total, how much did you pay for the purchase of arguileh tobacco from the store?	*Interviewer: if participant doesn't know, enter 999* ___ ___ ___ L.L.
B29. What was the arguileh tobacco brand name?	*Interviewer: record brand name* _____
B30. Approximately one year ago, how much arguileh tobacco did you buy from the store each month?	*Interviewer: record number and check unit* ___ ___ ___50 gram packs...........................[] 1 ___ ___ ___100 gram packs.......................[] 2 ___ ___ ___250 gram packs...........................[] 3 ___ ___ ___500 gram packs...........................[] 4 ___ ___ ___1 kilogram packs.....................[] 5 ___ ___ ___Other pack - specify weight: __.[] 6 ___ ___ ___Bulk - specify weight: _____...[] 7 Never bought arguileh tobacco...............[] 8 Don't know ....[] 999 No response ....[] 777

HH.10

B31.	Approximately one year ago, how much did you spend on arguileh tobacco purchases from stores each month ?	*Interviewer: if participant doesn't know, enter 999* ___ ___ ___ L.L. per month Don't know ....[] 999 No response ....[] 777
B32.	The last time you used arguileh delivery service, how many arguileh smoking heads/rocks did you buy and how much did you pay for these heads/rocks?	*Interviewer: record number and prices, if participant doesn't know, enter 999* Number:___ ___ ___ Price:___ ___ ___ **if the quantity is zero "0", skip questions B29– B33**
B33.	The last time you used arguileh delivery service, how much did you pay?	*Interviewer: if participant doesn't know, enter 999* *Insert price:* ___ _____ L.L.
B34.	How many heads did they offer you for free?	*Interviewer: Record number* ___ ___ ___ *Don't know ....[] 999* *No response ....[] 777*
B35.	Approximately one year ago, how many arguileh smoking heads/rocks did you order using arguileh delivery services each month and how much did you pay for these heads/rocks per month?	*Interviewer: In case the participant expressed difficulty, ask him how many arguileh's does he order per month and typically how many heads come with the arguileh and then multiply them. For example, if on average you smoke 20 arguileh's per month and it comes with 2 heads, then your total is 20x2=40.* *Record number and prices, if participant doesn't know, enter 999* Number:___ ___ ___ per month Price: ___ ___ ___ per month

HH.11

	Don't know ....[] 999
	No response ....[] 777
B36. Appro ximately one year ago, how much did you pay?	*Interviewer: Record price. If participant doesn't know, put 999.* ___ ___ ___ L.L. per month Don't know ....[] 999 No response ....[] 777
B37. How many heads did they offer you for free?	*Interviewer: record number* ___ ___ ___ *Don't know ....[] 999* *No response ....[] 777*
B38. Which of the following statements best describes your thinking about giving up <u>arguileh</u> smoking?	In the next 30 days ………………… []1 In the next 6 months ……………….[]2 In the next year ……………………..[]3 More than one year from now ...…….[]4 I don't want to quit …………………[]5 Don't know ....[] 999 No response ....[] 777
B39. In the past 12 months, have you stopped smoking arguileh for one day or longer because you were trying to quit?	Yes ………………………………...[]1 No ………………………………[]2 Don't know ....[] 999 No response ....[] 777
B40. In your opinion, is it acceptable for females to smoke waterpipe in general?	Yes ………………………………...[]1 No …………………………………[]2 Don't know ....[] 999 No response ....[] 777

Would you consider purchasing any tobacco products (cigarettes, arguileh tobacco, arguileh delivery, arguileh at a café,) at any time in the future?

Yes …………………..[]1

No……….…………...[]2

If the answer is "No" the interviewer should skip the DCE scenarios.

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SECTION C: DISCRETE CHOICE EXPERIMENT

Description:

- In the next section, you will see 8 hypothetical choice scenarios about buying tobacco for yourself, the only difference between the scenarios is the price of the tobacco products

- Each scenario will present you with 8 different tobacco products that you may purchase:

    1. Premium cigarettes like Marlboro, Davidoff, and Gitanes

    2. Discount cigarettes like Byblos, Cedars, and Maestro

    3. Premium mouassal arguileh tobacco (250 g) like Al Fakher, Nakhla, and Mazaya

    4. Discount mouassal arguileh tobacco (250 g) like Ya layl, Al Tamayoz

    5. Ajami arguileh tobacco (250 g) like Al Zaeem, Al Bacha, and Tombac Asfahani

HH.13

6. Home-delivery of prepared arguileh

7. Baladi/sha'bi arguileh cafes

8. Fancy arguileh cafes

- Each of the 8 product categories will have its own price, and the prices change in each scenario.

- You will be asked to imagine yourself buying your needs of arguileh and cigarette smoking products as you would typically in real life, and tell us how many items you would buy.

- You may choose to buy 1 or more items from some types and none (i.e. 0) from others. You may choose to buy nothing at all, in which case the answer will be 0 for all 8 tobacco products.

- Please seriously consider the prices at which each item is being offered when making your decision about the quantities. Make sure that the sum you spend on these products is in line with your budget for buying tobacco. Also, keep in mind that the money you spend on tobacco products will not be available for you to spend on other things.

- Here is an example of a choice scenario:

. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	**Cigarettes discount**	**Arguileh tobacco premium**	**Arguileh tobacco discount**	**Ajami**	**Arguileh home delivery**	**Arguileh at fancy cafe**	**Arguileh session at Sha'bi cafe**
	Pack of 20	**Pack of 20**	**250g pack**	**250g pack**	**250g pack**	**1 waterpipe**	**1 waterpipe**	**1 waterpipe**
Price	**5,000 L.L**	**1,250 L.L**	**13,500 L.L**	**10,250 L.L**	**20, 000 L.L**	**7,500 L.L**	**15,000 L.L**	**7,500 L.L**
Quantity	*1*	*0*	*2*	*0*	*0*	*0*	*1*	*2*

Now I leave you to complete the choice scenarios. **[INTERVIEWER: LEAVE THE PARTICIPANT TO FILL IN THE CHOICE SETS]**

VERSION 1

C1. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	2, 500 L.L	750 L.L	13, 500 L.L	10, 250 L.L	20, 000 L.L	7, 500 L.L	15, 000 L.L	7, 500 LL
Quantity								

C2. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Arguileh tobacco non-flavored	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	2, 500 L.L	750 L.L	20, 250 L.L	15, 250 L.L	67, 500 L.L	25, 250 L.L	33, 750 L.L	16, 750 L.L
Quantity								

HH.15

C3. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	4, 000 L.L	1, 250 L.L	30, 250 L.L	10, 250 L.L	45, 000 L.L	16, 750 L.L	50, 500 L.L	25, 250 L.L
Quantity								

C4. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	4, 000 L.L	1, 250 L.L	45, 500 L.L	15, 250 L.L	30, 000 L.L	11, 250 L.L	22, 500 L.L	11, 250 L.L
Quantity								

HH.16

C5. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	5, 500 L.L	1, 750 L.L	13, 500 L.L	23, 000 L.L	45, 000 L.L	16, 750 L.L	33, 750 L.L	16, 750 L.L
Enter quantity								

C6. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	5, 500 L.L	1, 750 L.L	20, 250 L.L	34, 500 L.L	30, 000 L.L	11, 250 L.L	15, 000 L.L	7, 500 L.L
Enter quantity								

HH.17

C7. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	8, 000 L.L	2, 500 L.L	30, 250 L.L	23, 000 L.L	20, 000 L.L	7, 500 L.L	22, 500 L.L	11, 250 L.L
Quantity								

C8. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh Café session premium	Waterpipe café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	8, 000 L.L	2, 500 L.L.	45, 500 L.L	34, 500 L.L	67, 500 L.L	25, 250 L.L	50, 500 L.L	25, 250 L.L
Quantity								

HH.18

VERSION 2

C1. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	2, 500 L.L	1, 250 L.L	30, 250 L.L	34, 500 L.L	20, 000 L.L	11, 250 L.L	33, 750 L.L	25, 250 LL
Quantity								

C2. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	2, 500 L.L	1, 250 L.L	45, 500 L.L	23, 000 L.L	67, 500 L.L	16, 750 L.L	15, 000 L.L	11, 250 L.L
Quantity								

HH.19

C3. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	4, 000 L.L	750 L.L	13, 500 L.L	34, 500 L.L	45, 000 L.L	25, 250 L.L	22, 500 L.L	7, 500 L.L
Quantity								

C4. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	4, 000 L.L	1,750 L.L	13, 500 L.L	23, 000 L.L	45, 000 L.L	16, 750 L.L	33, 750 L.L	16, 750 L.L
Quantity								

HH.20

C5. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	5, 500 L.L	2, 500 L.L	30, 250 L.L	15, 250 L.L	45, 000 L.L	25, 250 L.L	15, 000 L.L	11, 250 L.L
Enter quantity								

C6. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	5, 500 L.L	2, 500 L.L	45, 500 L.L	10, 250 L.L	30, 000 L.L	7, 500 L.L	33, 750 L.L	25, 250 L.L
Enter quantity								

HH.21

C7. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	8, 000 L.L	1, 750 L.L	13, 500 L.L	15, 250 L.L	20, 000 L.L	11, 250 L.L	50, 500 L.L	16, 750 L.L
Quantity								

C8. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh Café session premium	Waterpipe café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	8, 000 L.L	1, 750 L.L.	20, 250 L.L	10, 250 L.L	67, 500 L.L	16, 750 L.L	22, 500 L.L	7, 500 L.L
Quantity								

HH.22

VERSION 3

C1. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	2, 500 L.L	1, 750 L.L	13, 500 L.L	23, 000 L.L	30, 000 L.L	25, 250 L.L	22, 500 L.L	25, 250 LL
Quantity								

C2. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	2, 500 L.L	1, 750 L.L	20, 250 L.L	34, 500 L.L	45, 000 L.L	7, 500 L.L	50, 500 L.L	11, 250 L.L
Quantity								

HH.23

C3. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	4, 000 L.L	2, 500 L.L	30, 250 L.L	23, 000 L.L	67, 500 L.L	11, 250 L.L	33, 750 L.L	7, 500 L.L
Quantity								

C4. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	4, 000 L.L	2, 500 L.L	45, 500 L.L	34, 500 L.L	20, 000 L.L	16, 750 L.L	15, 000 L.L	16, 750 L.L
Quantity								

HH.24

C5. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	5, 500 L.L	750 L.L	13, 500 L.L	10, 250 L.L	67, 500 L.L	11, 250 L.L	50, 500 L.L	11, 250 L.L
Enter quantity								

C6. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	5, 500 L.L	750 L.L	20, 250 L.L	15, 250 L.L	20, 000 L.L	16, 750 L.L	22, 500 L.L	25, 250 L.L
Enter quantity								

HH.25

C7. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	8,000 L.L	1, 250 L.L	30, 250 L.L	10, 250 L.L	30, 000 L.L	25, 250 L.L	15, 000 L.L	16, 750 L.L
Quantity								

C8. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh Café session premium	Waterpipe café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	8, 000 L.L	1, 250 L.L.	45, 500 L.L	15, 250 L.L	45, 000 L.L	7, 500 L.L	33, 750 L.L	7, 500 L.L
Quantity								

HH.26

VERSION 4

C1. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	2, 500 L.L	2, 500 L.L	30, 250 L.L	15, 250 L.L	30, 000 L.L	16, 750 L.L	50, 500 L.L	7, 500 LL
Quantity								

C2. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	2, 500 L.L	2, 500 L.L	45, 500 L.L	10, 250 L.L	45, 000 L.L	11, 250 L.L	22, 500 L.L	16, 750 L.L
Quantity								

HH.27

C3. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	4, 000 L.L	1, 750 L.L	13, 500 L.L	15, 250 L.L	67, 500 L.L	7, 500 L.L	15, 000 L.L	25, 250 L.L
Quantity								

C4. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	4, 000 L.L	1, 750 L.L	20, 250 L.L	10, 250 L.L	20, 000 L.L	25, 250 L.L	33, 750 L.L	11, 250 L.L
Quantity								

HH.28

C5. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	5, 500 L.L	1, 250 L.L	30, 250 L.L	34, 500 L.L	67, 500 L.L	7, 500 L.L	22, 500 L.L	16, 750 L.L
Enter quantity								

C6. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	5, 500 L.L	1, 250 L.L	45, 500 L.L	23, 000 L.L	20, 000 L.L	25, 250 L.L	50, 500 L.L	7, 500 L.L
Enter quantity								

HH.29

C7. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh café session premium	Arguileh café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	8, 000 L.L	750 L.L	13, 500 L.L	34, 500 L.L	30, 000 L.L	16, 750 L.L	33, 750 L.L	11, 250 L.L
Quantity								

C8. **Think about the amount of arguileh and cigarette products you would purchase, based on the following prices:**

	Cigarettes premium	Cigarettes discount	Arguileh tobacco premium	Arguileh tobacco discount	Tombac Ajami	Arguileh home delivery	Arguileh Café session premium	Waterpipe café session at Sha'bi café
	Pack of 20	Pack of 20	250g pack	250g pack	250g pack	1 waterpipe	1 waterpipe	1 waterpipe
Price	8, 000 L.L	750 L.L.	20, 250 L.L	23, 000 L.L	45, 000 L.L	11, 250 L.L	15, 000 L.L	25, 250 L.L
Quantity								

For non-smokers only :

Interviewer: Fill this for non-smokers only. Choose the appropriate option.

1-   The participant filled out the scenarios

2-   The participant partially filled out the scenarios or the interviewer completed the

       scenarios.

HH.30

STROBE Statement—Checklist of items that should be included in reports of *cross-sectional studies*

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	3
Objectives	3	State specific objectives, including any prespecified hypotheses	4
Methods			
Study design	4	Present key elements of study design early in the paper	4
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	4
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	4
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	5
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	*5*
Bias	9	Describe any efforts to address potential sources of bias	5
Study size	10	Explain how the study size was arrived at	4
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	5
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	5
		(*b*) Describe any methods used to examine subgroups and interactions	5
		(*c*) Explain how missing data were addressed	5
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	5
		(*e*) Describe any sensitivity analyses	5
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	4
		(b) Give reasons for non-participation at each stage	
		(c) Consider use of a flow diagram	

Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	5 – 6
		(b) Indicate number of participants with missing data for each variable of interest	
Outcome data	15*	Report numbers of outcome events or summary measures	6-12
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	6-12
		(*b*) Report category boundaries when continuous variables were categorized	p.6 (table 1), p.8 (table 2), p.10 (table 3), p.12 (table 4)
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	p.6 (table 1), p.8 (table 2),
Discussion			
Key results	18	Summarise key results with reference to study objectives	13
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	14
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	13
Generalisability	21	Discuss the generalisability (external validity) of the study results	13
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	15

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.