

# Estimated and projected prevalence of tobacco smoking in males, Eastern Mediterranean Region, 2000–2025

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## Abstract

**Background:** Three global reports published by the World Health Organization (WHO) report trends in the prevalence of tobacco smoking from 2000 to 2025 based on data from national surveys.

**Aims:** The study aimed to: (i) compare current and projected prevalence rates of tobacco smoking presented in these reports for males  $\geq 15$  years in countries of the Eastern Mediterranean Region; and (ii) assess changes in the prevalence rates in the context of changes in tobacco monitoring and control policies in these countries.

**Methods:** Regional and country-level data on tobacco smoking were extracted from the trend reports. Percentage point differences between the estimated prevalence of tobacco smoking in 2010 and the projected prevalence in 2025 were calculated for countries with available data. Data on implementation of national surveys and policies on tobacco use were obtained from relevant WHO reports.

**Results:** In the latest trend report (2019), the prevalence of male current tobacco smoking is projected to decrease by less than 2 percentage points in the Region (from 33.1% in 2010 to 31.2% in 2025). The projections for male tobacco smoking for 2025 in the 2019 report are more encouraging than in the 2015 report in seven of the eight countries of the Region. For five of these seven countries, implementation of tobacco monitoring and tobacco control policies improved over the same period.

**Conclusions:** Countries of the Region need to conduct additional national tobacco-use surveys to improve the accuracy of prevalence estimates and projections. Such data can help guide policy-makers to implement policies to control tobacco smoking.

Key words: tobacco smoking, prevalence, male, Eastern Mediterranean Region

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## Introduction

Tobacco is one of the leading preventable causes of morbidity and premature mortality in the world and contributed to 8 million deaths globally in 2017 (1). About 80% of these deaths occurred in developing countries. In 2013, the World Health Assembly endorsed the World Health Organization's (WHO) Global Monitoring Framework for Noncommunicable Diseases (NCDs) and an associated voluntary global target of a 30% relative reduction in tobacco use worldwide in people aged 15 years and older by 2025 (with 2010 levels as the baseline) (2).

Updated data on tobacco use are necessary to identify key gaps in policies on tobacco control. To overcome this challenge, WHO and the US Centers for Disease Control and Prevention have developed a number of surveys designed to track tobacco use among young people (13–15 years) and adults for implementation at the country level (3). These surveys include the global youth tobacco survey, global adult tobacco survey and STEPwise surveillance of NCD risk factors survey.

WHO published three global reports, in 2015, 2018 and 2019 (4–6), that track trends in the prevalence of tobacco

smoking from 2000 to 2025 based on data from national surveys. These WHO trend reports are companions to the two-yearly WHO report on the global tobacco epidemic (7). This two-yearly report provides the opportunity to compare developments in tobacco control policies with the prevalence projections given in the trend reports.

We aimed to review and compare regional and country projections on the prevalence of current tobacco smoking given in the WHO trend reports. We highlight how the projected prevalence of tobacco smoking in the WHO Eastern Mediterranean Region has changed over time and in the context of globally recognized targets for reduction in tobacco use. We consider the data from the trend reports in the context of the implementation of country-level surveillance systems and the implementation of national tobacco control policies. This approach provides a relevant and detailed insight into current and future tobacco smoking in the Region and the likely effect of improved monitoring efforts and policy changes on projected prevalence rates. It also allows specific recommendations to be made for both future tobacco use surveillance systems and tobacco control policy-making.

## Methods

The three WHO trends reports contain globally comparable national estimates for tobacco smoking prevalence for the years 2000–2025. In these reports these estimates are summarized into global and regional prevalence estimates and projections. For the projection analysis, the reports use data from nationally representative surveys of tobacco use (or tobacco smoking) published since 1990. The full details of the method for producing trend estimates and projections is described in the trend reports themselves (4–6). In the 2015 trend report, eight countries of the Region had sufficient survey data for projections to be made. In the 2018 and 2019 trend reports, 14 countries had sufficient data for projections to be made.

We focused on tobacco smoking because it is the indicator used in all three trend reports (unlike tobacco use). Tobacco smoking is also by far the most common form of tobacco use in the Region (6). We calculated the projected percentage point increases in tobacco smoking between 2000 and 2025 for the Region overall by sex, and by country for males. We only reviewed current male tobacco smoking because male smokers make up most smokers in the Region (6) and some concerns exist about the reliability of data for current female tobacco smoking. In all cases, we calculated the projected percentage point increase for current tobacco smoking between 2000 and 2025 by subtracting the estimated current tobacco smoking prevalence in 2000 from the projected prevalence in 2025. We compared country-level results from the 2015 and 2019 trend reports to assess changes between the reports in the projected percentage point increase for current male tobacco smoking between 2000 and 2025.

We assessed changes between the 2015 and 2019 reports in country-level projected percentage point increases for current male tobacco smoking and the extent to which tobacco use was monitored nationally. We obtained data on implementation of national tobacco surveys from the WHO Report on the Global Tobacco Epidemic and the trend reports (4,6,7). We also assessed changes in national tobacco control policies between 2015 and 2019. We obtained information on these policy changes from the WHO reports on the global tobacco epidemic for 2015 and 2019. We used progress in the implementation of any WHO “demand-reduction” MPOWER measure as the metric: protect people from tobacco smoke; offer help to quit tobacco use; warn about the dangers of tobacco; enforce bans on tobacco advertising, promotion and sponsorship; and raise taxes on tobacco (7,8). The demand-reduction MPOWER measures are the five policy recommendations included in the WHO MPOWER package that have been shown to reduce the prevalence of tobacco use when implemented (i.e. all of the MPOWER measures except the monitoring measure) (7).

## Results

In the latest trend report of 2019 (6), decreases in overall

tobacco smoking rates are projected in all WHO Regions. The smallest decrease is expected in the Eastern Mediterranean Region, where the overall tobacco smoking prevalence is projected to drop from 18.3% in 2010 to 16.3% in 2025, if current tobacco control efforts continue. This equates to an 11% relative reduction in overall tobacco smoking prevalence. For men, who make up most of all smokers in the Region, the prevalence of current tobacco smoking is projected to decrease by less than 2 percentage points from 33.1% in 2010 to 31.2% in 2025.

Unlike the 2019 trend report, both the 2015 and 2018 reports projected an increase in overall tobacco smoking prevalence in the Eastern Mediterranean Region between 2010 and 2025 (of 5 percentage points in the 2015 report and less than 1 percentage point in the 2019 report) (4,5). All three WHO trend reports projected that the Region was unlikely to achieve a 30% relative reduction in the prevalence of tobacco smoking by the year 2025 (4–6).

For country-level projections of the prevalence of male current tobacco smoking in the 2015 trend report (Table 1), the rates in all but one country were projected to increase in percentage points between 2000 and 2025. This ranged from 9.9 percentage points in Pakistan to 68.8 percentage points in Bahrain. Only in the Islamic Republic of Iran was the prevalence tobacco smoking projected to decrease, by 8.2 percentage points.

For country-level projections of the prevalence of male current tobacco smoking in the 2019 trend report (Table 2), the rates in four countries were projected to increase in percentage point terms (Egypt, Lebanon, Oman and Saudi Arabia). All of these increases were less than 4 percentage points, with the highest increase projected for Oman (3.7 percentage points). The prevalence rates in the remaining 10 countries were projected to decrease. These ranged from a decrease of 2.1 percentage points for Bahrain to a decrease of 27.4 percentage points for Tunisia.

Of the eight countries for which trend projections were calculated in both reports (Bahrain, Egypt, Islamic Republic of Iran, Lebanon, Morocco, Oman, Pakistan and Saudi Arabia), all but one country (Islamic Republic of Iran) saw a decline in the projected percentage point increase for current male tobacco smoking between 2000 and 2025 (Table 1 and Table 2). For three of these seven countries, this decline in the projected increase between 2000 and 2025 was enough to take the country from a projected increase in the prevalence of current male tobacco smoking in the 2015 trend report to a projected decrease in the 2019 report. For the remaining four countries, the prevalence of current male tobacco smoking was still projected to increase in percentage points between 2000 and 2025 in the 2019 report, but to a lesser extent than in the 2015 report.

Of the six countries for which the projection was only done in the 2019 report, all were projected to see a percentage point decrease in the prevalence of current male tobacco smoking between 2000 and 2025.

Over the same period as the three trend reports (2015–

**Table 1 Estimated and projected tobacco smoking among males  $\geq 15$  years in the WHO Eastern Mediterranean Region, by country, 2000 and 2025**

Country <sup>a</sup>	Estimated prevalence of tobacco smoking in males, 2000 (%)	Projected prevalence of tobacco smoking in males, 2025 (%)	Absolute percentage point difference <sup>b</sup>
Bahrain	18.4	87.2	68.8
Egypt	34.2	62.9	28.7
Islamic Republic of Iran	26.7	18.5	-8.2
Lebanon	34.4	57.1	22.7
Morocco	34.0	57.6	23.6
Oman	12.8	33.3	20.5
Pakistan	35.2	45.1	9.9
Saudi Arabia	21.1	36.1	15.0

<sup>a</sup>Other countries of the Region were either not included in the report because their profiles were yet to be finalized (Djibouti, Jordan, Qatar, Syrian Arab Republic, Tunisia, United Arab Emirates), or no data were available.

<sup>b</sup>A negative value indicates a projected decrease in the prevalence between 2000 and 2025.

Source: WHO trend report, 2015 (4).

2019), country-level tobacco use surveys and surveillance systems have been implemented in several countries of the Region. As noted above, the projection was done for six more countries in the 2018 and 2019 trend reports than in the 2015 report (4–6). This increase indicates that many more countries now have more robust data on tobacco use and smoking, of the kind that allows useful trend projections to be calculated.

Of the countries for which the projected percentage point increase in the prevalence of tobacco smoking in males between 2000 and 2025 decreased between the 2015 and 2019 trend reports (as described above), the number of national surveys on adult smoking since 2000, which are used to calculate country-specific trends, increased in five of these countries: Egypt (from five to six surveys), Lebanon (from four to five), Morocco (from four to five), Oman (from two to three) and Pakistan (from three to five) (4,6,7). The number of such surveys stayed the same in Bahrain and Saudi Arabia.

Of the seven countries for which the projected percentage point increase in the prevalence of smoking in males between 2000 and 2025 decreased between the 2015 and 2019 trend reports (as described above), five improved their performance for at least one of the five “demand-reduction” MPOWER measures between 2015 and 2019 (7,8). Bahrain and Pakistan improved their performance for one measure each, Egypt and Oman improved their performance for two measures each and Saudi Arabia improved its performance for four measures.

## Discussion

In seven countries of the Eastern Mediterranean Region, the 2019 trend report show more encouraging projections to 2025 for the prevalence of current male tobacco smoking compared with the 2015 trend report. It is reasonable to suppose that this improved outlook is at least in part due to improved monitoring which provides a more accurate picture of actual current tobacco use. The cut-off points for national tobacco surveys used as data points by

the 2015 and 2019 trend reports (the years 2014 and 2018, respectively) differed by only about 4 years, making it unlikely that policy change was solely responsible for the reduction actual tobacco use.

Nevertheless, considering changes in the country-level projections in the 2015 and 2019 trend reports in the context of implementation of tobacco control policies is still important. It is likely that for many of the countries that have more encouraging projections in the 2019 trend report than in the 2015 report, their improved tobacco control policies have played a key role, including in Bahrain, Egypt, Oman, Pakistan and Saudi Arabia. In general, many countries moved forward with MPOWER policy strengthening between 2015 and 2019, including for the monitoring measure (7,8).

Despite this progress, a number of countries have not achieved any legal policy improvement since the publication of the 2015 trend report and the 2015 edition of the WHO Report on the Global Tobacco Epidemic (7,8). These countries include some that have more encouraging projections in the 2019 trend report than the 2015 report; as noted above, this is likely due to improvements in monitoring. Other countries in the Region have moved backwards with respect to key tobacco control policies since 2015 or have implemented only moderate policy changes, such as banning tobacco use in some, but not all, public places, which are substantially less likely to have an effect on reducing the prevalence of tobacco smoking (7).

The above situation and the fact that none of the countries in the Region, except one (Islamic Republic of Iran), is projected to achieve the target of a 30% relative reduction in tobacco use by 2025 (6) are symptoms of the following factors. First, a steady and systematic approach to moving forward with tobacco control across the Region as a whole is lacking (9), and countries regularly make retrogressive changes to their tobacco control policies, even while other positive policy changes are being made

**Table 2 Estimated and projected tobacco smoking among males  $\geq$  15 years in the WHO Eastern Mediterranean Region, by country, 2000 and 2025**

Country <sup>a</sup>	Estimated current male tobacco smoking, 2000 (%)	Projected current male tobacco smoking, 2025 (%)	Absolute percentage point difference <sup>a</sup>
Bahrain	36.6	34.5	-2.1
Egypt	40.3	42.6	2.3
Islamic Republic of Iran	25.9	18.3	-7.6
Iraq	38.1	33.5	-4.6
Kuwait	41.0	36.7	-4.3
Lebanon	40.2	41.4	1.2
Morocco	39.0	23.4	-15.6
Oman	13.6	17.3	3.7
Pakistan	37.2	27.6	-9.6
Qatar	26.2	23.9	-2.3
Saudi Arabia	23.3	25.4	2.1
Tunisia	64.2	36.8	-27.4
United Arab Emirates	35.7	28.5	-7.2
Yemen	35.5	24	-11.5

<sup>a</sup>Other countries of the Region were excluded because no data were available.

<sup>a</sup>A negative value indicates a projected decrease in prevalence between 2000 and 2025.

Source: WHO trend report, 2019 (6).

(7,10). Second, in many cases a multisectoral approach is missing (2). Third, a comprehensive approach to tobacco control is often lacking, with policy-makers selecting certain policies to implement and not others, which is not effective in reducing the prevalence of smoking (11). Fourth, the humanitarian emergencies in many countries of the Region are affecting progress across the whole Region, as recently indicated in a report of the WHO Framework Convention on Tobacco Control (FCTC) to the FCTC Conference of Parties (12). Individually, these countries are unable to move forward in tobacco control and they also make it harder for other countries in the Region to continue to improve.

As outlined in the trend results, considerable gender differences in tobacco smoking exist in the Region. Research suggests that this difference is attributable to the social stigma attached to smoking among women in countries of the Region (13). The standardized survey methods call for family visits to collect data on smoking behaviour. In the presence of male members of the family, women may be reluctant to reveal their true smoking behaviour and are therefore more likely to underreport smoking than their male counterparts because of sociocultural factors (14).

The prevalence of smoking among adolescent women is notably higher than among adult women (15). This difference could be the result of less underreporting by this younger population because of increased openness about smoking (14). It could also reflect some bias related to the fact that adolescent girls who are not in school are excluded from the school-based surveys. Another reason for the difference may be the relative anonymity of the data collection process among the adolescent

population. Respondents of adult surveys, where data are typically collected in the home, may feel anonymity is less assured. The prevalence of smoking of all types of tobacco products among young people in the Region can reach 42% in boys and 31% in girls (15). These rates include waterpipe smoking, which is in fact more popular among young people than cigarettes (15).

External factors such as religious beliefs might also play an important role in influencing smoking behaviour in the Region. However, the effect of such factors on tobacco use has not been sufficiently studied (16).

Our study has some limitations. Of all WHO Regions, the Eastern Mediterranean Region has the lowest level of coverage of national surveys that monitor smoking. Since 2013, only 15 of the 22 countries of the Region have completed a nationally representative survey of adults that measures some form of tobacco use, and made these results public (6). Three countries (Afghanistan, Libya and Sudan) have no results in the WHO trend reports because they have done only one survey to date, while at least two surveys are needed to calculate a trend. Somalia is among the six countries globally that have produced no nationally representative data on tobacco use among adults (5).

Other indicators of tobacco use, such as smokeless tobacco use, waterpipe use and cigarette use by children aged 13–15 years, were not projected in the trend reports. Despite the fact that Parties to the WHO are required to monitor all forms of tobacco use, some have technical and logistic problems in implementing the recommended surveys. Of the 181 Parties to the FCTC, only 76 countries regularly monitor all types of tobacco use in both their



adult and child populations, which accounts for only 40% of the world's population (5). Data on the use of electronic nicotine delivery systems, including electronic cigarettes, are just beginning to be collected.

The reliance of all tobacco use surveys on self-reporting of tobacco use is another limitation, especially if various cultural factors make it likely that tobacco use is underreported. According to one study that compared estimates of the prevalence of smoking produced from self-reported data against the estimates based on measured smoking biomarkers, self-reported smoking often results in underreporting, so much so that the true smoking figures can be underestimated by up to 47% (17).

## Recommendations

Compared to a high ( $\geq 95\%$ ) probability of a decline in smoking prevalence for most countries in the American, European and Western Pacific regions of WHO for both men and women, the possibility of an increase in prevalence of smoking in the Eastern Mediterranean Region is high, especially among men (6). With the uncertain decline of smoking rates in the Region, and the slow pace of implementation of tobacco control measures in many countries, the economic burden attributed to tobacco-related diseases could increase (18). This situation will in turn prevent most countries in the Region from achieving a 30% reduction in tobacco use by 2025 and undermine attempts to progress the goals of universal health coverage (19). Continued monitoring is essential to inform and sensitize decision-makers from the Region about this public

health epidemic, the socioeconomic burdens caused by tobacco use, and the growing use among young people and females that had not been anticipated (18).

Incomplete data is one of the greatest challenges; some countries of the Region have not conducted a national survey for over a decade. In addition, some surveys do not provide sufficient detail, such as tobacco use by age. Efforts to monitor tobacco use with cost-effective solutions should be considered, such as inclusion of tobacco questions within other surveys that countries already implement (20).

Solutions to the problem of underreporting could include ensuring respondents have privacy when completing the survey. Another solution would be to manually identify individuals who are likely to have misreported, such as women during pregnancy, and ignore or correct their testimony, e.g. by identifying current smoking using cotinine blood tests or exhaled breath carbon monoxide monitors (21). Governments should take underreporting into consideration in their policy-making as long as it continues.

Data on the nature and scale of the tobacco epidemic should be used to implement targeted and effective policies to reduce its use, including the “demand-reduction” MPOWER measures (7). All countries of the Region could do more to strengthen and improve implementation of these proven measures.

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## Estimations et projections de la prévalence du tabagisme chez les hommes dans la Région de la Méditerranée orientale pour la période 2000-2025

### Résumé

**Contexte :** Trois rapports mondiaux publiés par l'Organisation mondiale de la Santé (OMS) rendent compte des tendances en matière de prévalence du tabagisme entre 2000 et 2025 sur la base de données issues d'enquêtes nationales.

**Objectifs :** L'étude a pour objectifs : i) de comparer les taux de prévalence actuels et prévus du tabagisme présentés dans ces rapports pour les hommes âgés de 15 ans et plus dans les pays de la Région de la Méditerranée orientale ; et ii) d'évaluer les évolutions des taux de prévalence dans le contexte des changements apportés aux politiques de surveillance et de lutte antitabac dans ces pays.

**Méthodes :** Les données régionales et nationales sur le tabagisme ont été extraites des rapports concernant les tendances. Les différences de points de pourcentage entre la prévalence estimée du tabagisme en 2010 et la prévalence prévue pour 2025 ont été calculées pour les pays pour lesquels des données étaient disponibles. Les données relatives à la mise en œuvre des enquêtes nationales et des politiques de lutte antitabac ont été tirées des rapports pertinents de l'OMS.

**Résultats :** Dans le dernier rapport sur les tendances (2019), il est prévu que la prévalence du tabagisme chez les hommes devrait baisser de moins de deux points de pourcentage dans la Région de la Méditerranée orientale (de 33,1 % en 2010 à 31,2 % en 2025). Les projections dans le rapport de 2019 concernant le tabagisme chez les hommes pour l'année 2025 sont plus encourageantes que celles du rapport de 2015 dans sept des huit pays de la Région qui sont inclus dans les deux rapports. La mise en œuvre de politiques de surveillance et de lutte antitabac s'est améliorée dans cinq de ces sept pays au cours de la même période.

**Conclusion :** Les pays de la Région doivent mener des enquêtes nationales supplémentaires pour améliorer l'exactitude des estimations et des projections de la prévalence. De telles données peuvent aider à guider les responsables de l'élaboration des politiques dans la mise en œuvre de politiques positives pour lutter contre le tabagisme.

## معدل الانتشار التقديري والمتوقع لتدخين التبغ في صفوف الذكور، إقليم شرق المتوسط، من 2000 إلى 2025

هبة فؤاد، أليسون كومار، رنده حمادة، فاطمة العوا، زي شن، تشارلز فريزر

### الخلاصة

الخلفية: رصدت ثلاثة تقارير عالمية نشرتها منظمة الصحة العالمية اتجاهات معدل انتشار تدخين التبغ من عام 2000 إلى عام 2025 استناداً إلى البيانات المستمدة من المسوحات الوطنية.

الأهداف: هدفت هذه الدراسة إلى: (1) مقارنة معدلات الانتشار الحالية والمتوقعة لتدخين التبغ والواردة في تلك التقارير للذكور الذين تتراوح أعمارهم بين 15 أو أكثر في بلدان إقليم شرق المتوسط؛ (2) تقييم التغيرات في معدلات الانتشار في سياق التغيرات التي تطرأ على سياسات رصد التبغ ومكافحته في تلك البلدان.

طرق البحث: استُخرجت بيانات إقليمية وقطرية بشأن تدخين التبغ من تقارير الاتجاهات. وتم احتساب فروق النقاط المئوية بين معدل الانتشار التقديري لتدخين التبغ في عام 2000 ومعدل الانتشار المتوقع في عام 2025 بالنسبة للبلدان التي تتوافر بشأنها البيانات. وأخذت البيانات حول تنفيذ المسوحات والسياسات الوطنية بشأن تعاطي التبغ من التقارير ذات الصلة الصادرة عن منظمة الصحة العالمية.

النتائج: يتوقع أحدث تقرير اتجاهات (2019) أن ينخفض المعدل الحالي لتدخين التبغ بين الذكور بنسبة تقل عن نقطتين مئويتين في إقليم شرق المتوسط (من 33.1٪ في 2010 إلى 31.2٪ في 2025). وجاءت التوقعات الخاصة بتدخين التبغ بين الذكور لعام 2025 في تقرير عام 2019 مُشجعة أكثر من تقرير عام 2015 في سبعة من بين ثمانية بلدان وردت معلومات عنها في كلا التقريرين. وخلال نفس الفترة الزمنية، تحسّن تنفيذ سياسات رصد التبغ ومكافحته على حد سواء في خمسة بلدان من تلك البلدان السبعة.

الاستنتاج: ينبغي أن تُجري بلدان الإقليم مسوحات وطنية إضافية لتحسين دقة تقديرات معدل الانتشار وتوقعاته. ويمكن أن تساعد تلك البيانات في توجيه رسمي السياسات لتنفيذ سياسات إيجابية لمكافحة تدخين التبغ.

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