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Economic Research Informing  
Tobacco Control Policy

# Tobacconomics Cigarette Tax Scorecard

## 2nd Edition



## Scoring Component Policy Note – Affordability Change

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**About Tobacconomics:** Tobacconomics is a collaboration of leading researchers who have been studying the economics of tobacco control policy for over 30 years. The team is dedicated to helping researchers, advocates, and policy makers access the latest and best research about what's working—or not working—to curb tobacco consumption and its economic impacts. As a program of the University of Illinois Chicago, Tobacconomics is not affiliated with any tobacco manufacturer. Visit [www.tobacconomics.org](http://www.tobacconomics.org) or follow us on Twitter at [www.twitter.com/tobacconomics](https://www.twitter.com/tobacconomics).

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**The Tobacconomics Cigarette Tax Scorecard** evaluates countries' cigarette tax systems based on a five-point rating system that incorporates international guidance and best practices in tobacco taxation developed by the World Health Organization (WHO), the WHO Framework Convention on Tobacco Control (FCTC), the World Bank (WB), and academics and researchers worldwide. The five-point index uses data from the World Health Organization's biennial *Report on the Global Tobacco Epidemic (RGTE)* (WHO, 2021a) to score countries on the following four components: cigarette price, changes in the affordability of cigarettes over time, the share of taxes in retail cigarette prices, and the structure of cigarette taxes. The total score reflects an average of the four component scores.

## Why is the change in affordability important?

Cigarette consumption typically increases when prices decrease. At the same time, changes in income also affect smoking behavior, with increases in income often resulting in greater consumption. Cigarette affordability addresses both price and income by reflecting an individual's ability to purchase cigarettes. Generally, excise tax increases that lead to an increase in price make tobacco products less affordable because—all else equal—more resources are now required to purchase the same amount of tobacco products (U.S. National Cancer Institute & World Health Organization [NCI & WHO], 2016).

Cigarette affordability is measured as the ratio of cigarette price to income, using various measures of prices and income. The most widely used metric is the affordability index provided by *RGTE* data. It is defined as the percentage of gross domestic product (GDP) per capita required to purchase 2000 cigarettes of the most-sold brand. The index value rises when the price increase is more significant than the increase in income (all other variables remaining constant). A higher index indicates that cigarettes are less affordable since more of an individual's income is needed to purchase the same number of cigarettes.

The Guidelines for Article 6 of the WHO FCTC state that increases in real prices reduce tobacco use (WHO, 2014). However, in recent decades, many low- and middle-income countries (LMICs) have seen rapid growth in incomes and inflation, and these increases in inflation and purchasing power can erode the impact of tax and price increases on consumption (NCI & WHO, 2016; World Bank, 2017). For this reason, the Article 6 Guidelines emphasize the importance of taking income growth and inflation into consideration when raising tobacco taxes, recommending that tax increases should be large enough to make tobacco products less affordable over time.

The latest evidence on cigarette affordability shows that from 2010 to 2020 cigarettes became less affordable in 84 countries—evenly distributed across high-, middle-, and low-income countries—and affordability remained unchanged in 68 countries. Over the same time period cigarettes became more affordable in 20 countries, 17 of which are LMICs (WHO 2021a). Although the evidence remains mixed on whether the effect size differs by country income level, there is strong evidence that increases in relative prices (lower affordability) lead to reductions in cigarette consumption (Blecher & Van Walbeek, 2004, 2009; He et al., 2018). Thus, tax practitioners must assess cigarette prices not only in absolute terms but also in terms of whether cigarettes are becoming more or less affordable over time (WHO 2021b).

This Scorecard focuses on the changes in affordability over time rather than a static measure of cigarette affordability. Cigarette affordability is likely to be correlated with the cigarette price, which is one

of the other three components in the Scorecard. However, reduced affordability over time is critical for reducing tobacco use—something that will not be captured by the cigarette price component of the Scorecard.

## Scoring criteria of affordability change

The Scorecard evaluates the trend in cigarette affordability in each country by utilizing the average annual percentage change (AAPC) in the affordability index over six years. The AAPC is computed by fitting a linear regression trend line to the logarithmic values of the affordability index. Scores are based on both a statistically significant change in AAPC and at least one tax increase during the time period and are determined as follows:



### Scoring – Change in Affordability:

5: 7.5% average annual reduction or higher

4:  $5.0\% \leq$  average annual reduction  $< 7.5\%$

3:  $2.5\% \leq$  average annual reduction  $< 5.0\%$

2: Average annual reduction  $< 2.5\%$

1: Reduced affordability, but no tax increase

0: Increased affordability or no significant reduction

## Strengths and weaknesses of the measure

Using the average annual change in the affordability index is a simple yet effective method to examine trends over a given period of time. Observing the change in affordability helps tax practitioners understand the changes in price relative to changes in income and purchasing power and implement an effective tax policy to make cigarettes less affordable.

There is some methodological debate, however, regarding the best income measure to use. The present analysis uses GDP per capita, following the method used in the WHO *RGTE* (WHO, 2015, 2017, 2019, 2021). It is a broad and widely available measure of income and includes the provision of public goods and services such as education and medical expenses. However, in highly unequal societies, which are many, the per capita measure can be very distant from the actual median income, which better represents the income available to most people but is not consistently available in many countries.

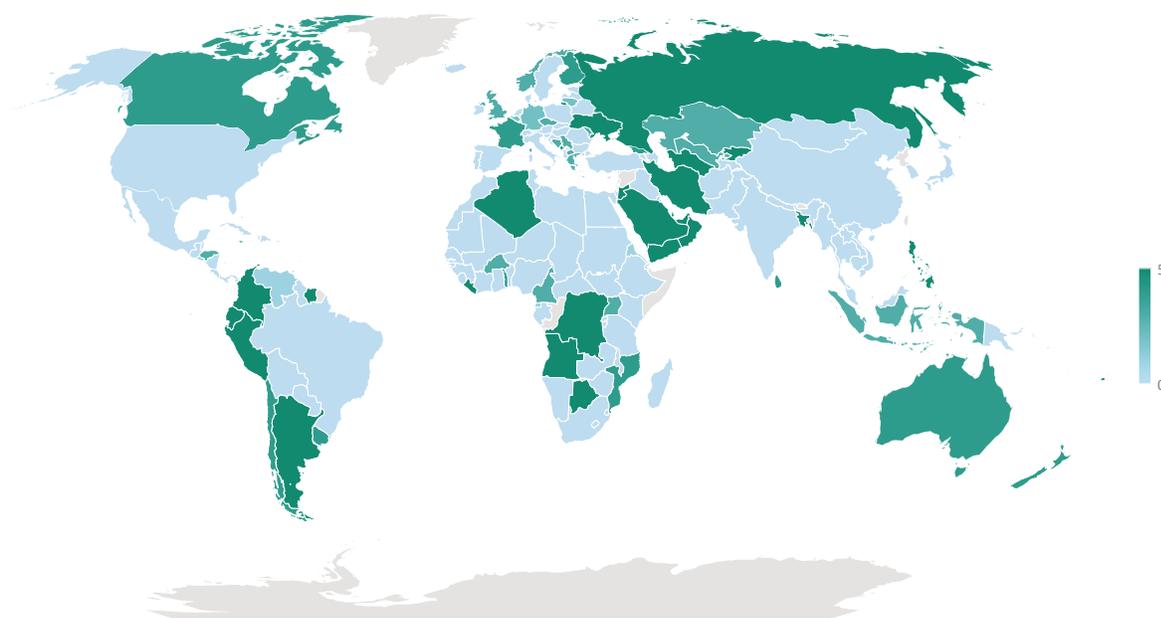
Data availability issues exist for prices as well. In some countries, the price of the most-sold brand used in *RGTE* data does not capture the variability in cigarette prices in the market. For example, in Bangladesh, the price of the most-sold brand used in the analysis is more than twice the price of the cheapest brand available. The Scorecard uses ‘most-sold brand’ because it provides data for the most countries over time. Unfortunately, data for the price of the least-expensive brand—an indicator of a consumer’s barrier to entry into the marketplace—are less available. The tax structure score, which is one of the other three components in the Scorecard, partially addresses these concerns since the price variability of cigarette prices is greatly affected by the tax structure in each country: better structures greatly compress that variability. The cigarette affordability measure also does not capture opportunities to substitute to other tobacco products for which the trend in affordability may differ from the trend for cigarettes.

Despite these shortcomings, reducing the affordability of tobacco products is paramount to reducing tobacco use. Especially as countries experience rapid economic growth, like many LMICs have experienced in the last two decades, increases in taxes that raise prices above both inflation and income growth are critical to achieving public health goals. Hence, it is not only important to increase the retail price of tobacco products but, more importantly, to reduce their affordability.

## Affordability change scores in 2020

Figure 1 presents the scores for the changes in cigarette affordability between 2014 and 2020. Among the 187 countries with available data, 26 countries received the highest score of five in 2020 (up from 22 in 2018), led by the Islamic Republic of Iran (average annual reduction of 26.44 percent), Saudi Arabia (22.47 percent), Oman (19.74 percent), Qatar (19.66 percent), and the United Arab Emirates (18.14 percent). In contrast, most countries—114 of the 187—received a score of zero because they saw either no statistically significant change in affordability over time (94 countries) or a significant increase in affordability (20 countries).

**Figure 1** Affordability change scores, 2020

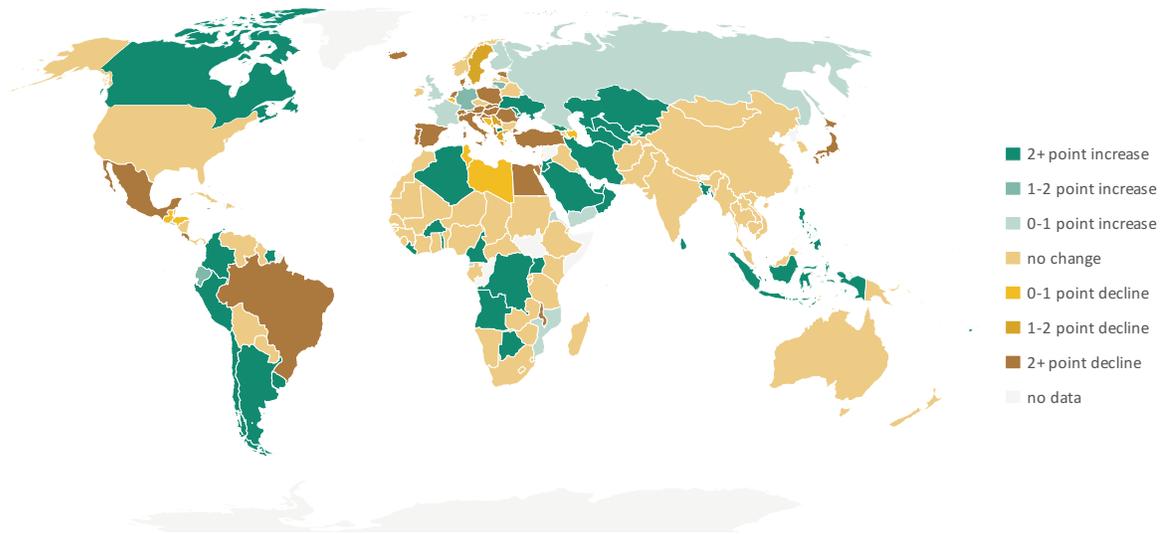


Note: Countries in gray lack available data on this measure.

## Change over time

As demonstrated in Figure 2 below, over the past six years there has been a slight improvement in cigarette affordability scores between 2014 (global average score of 1.26) and 2020 (global average of 1.40), accompanied by an increase in countries with the highest score of five (from 15 countries in 2014 to 26 countries in 2020). However, over the past six years while 39 countries have experienced more than a two-point increase, 37 countries have seen a two-point-or-greater decline.

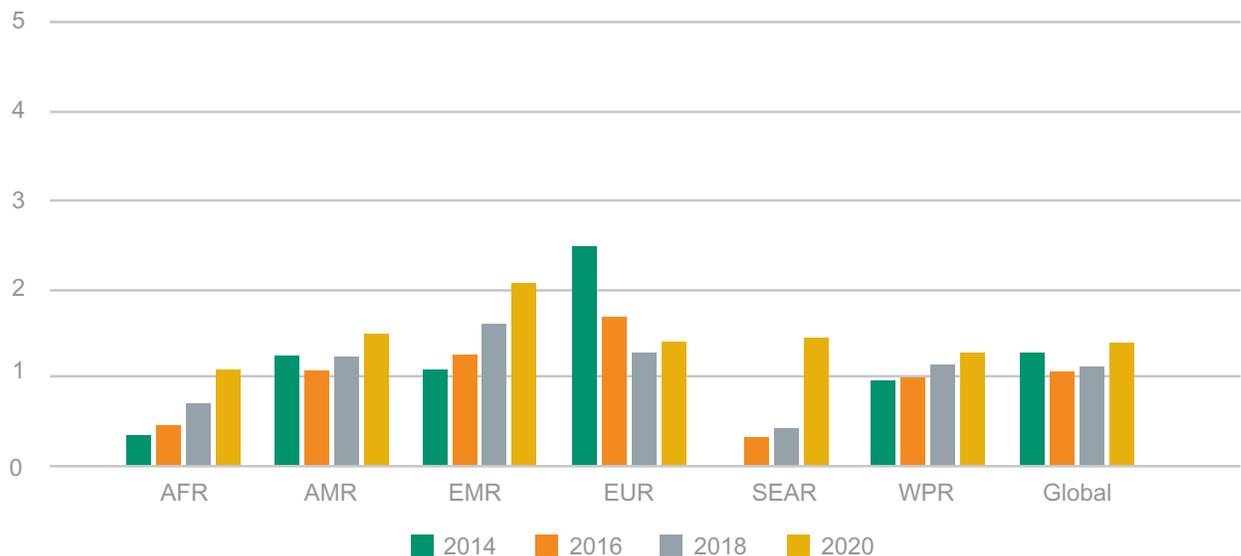
**Figure 2** Changes in countries' affordability change scores, 2014–2020



Note: Countries in gray lack available data on this measure.

Figure 3 shows the average scores regionally and globally for the affordability component of the Scorecard. From 2014 to 2020, the European region saw a score decline in affordability change (from 2.46 to 1.38), while all other regions had increases in their average affordability change scores. The South-East Asia region experienced the greatest average score increase in affordability change component from 0.00 to 1.44.

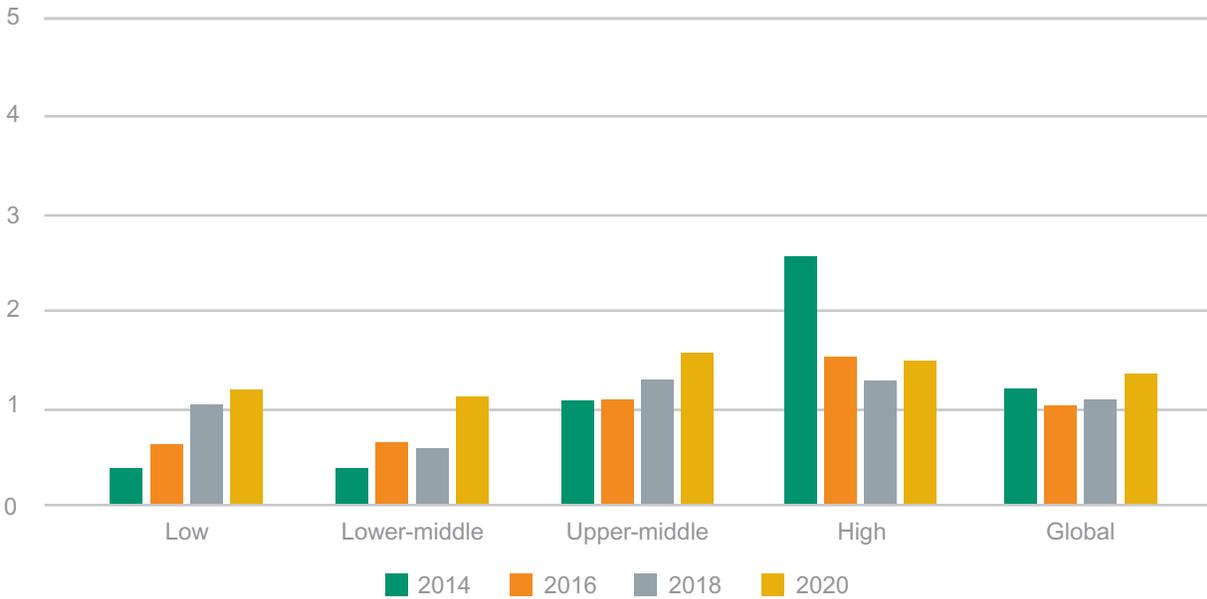
**Figure 3** Average affordability change score, globally and by WHO region, 2014–2020



Note: Affordability scores from 2018 were revised using the updated affordability measures in the most recent *RGTE* data (2021). A full list can be found in Appendix 4 of the Scorecard, second edition.

As shown in Figure 4, lower-middle-income countries scored worst on the affordability measure in 2020, while the upper-middle-income countries scored highest. The lower scores for lower-middle-income countries are at least in part attributable to the relatively greater increases in income in these countries. From 2014 to 2020, the average score of the high-income countries dropped from 2.58 to 1.52, although the score slightly increased between 2018 and 2020.

**Figure 4** Average affordability change score, globally and by World Bank income group, 2014–2020



Note: Affordability scores from 2018 were revised using the updated affordability measures in the most recent *RGTE* data (2021). A full list can be found in Appendix 4 of the Scorecard, second edition.

## Policy recommendations



These data show that affordability of cigarettes is a metric that must be regularly evaluated given dynamic shifts in inflation and income growth. The scores also reveal that the majority (over 60 percent) of countries are not reducing the affordability of cigarettes with effective cigarette tax policies. Modest increases in cigarette taxes that do not, at the very least, account for these shifts in inflation and income growth will not be as effective in achieving public health goals. By imposing higher and better-designed cigarette taxes, countries can continuously increase the prices and reduce the affordability of cigarettes, thus decreasing cigarette consumption.

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