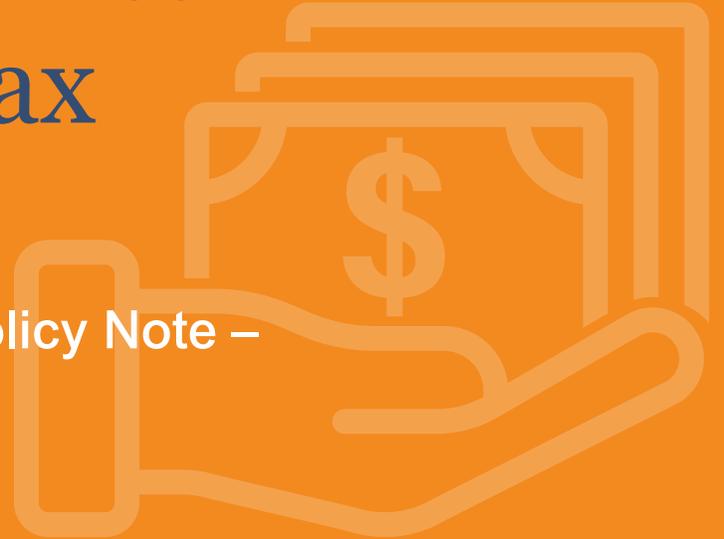


Tobacconomics Cigarette Tax Scorecard

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 nearly 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 or follow us on Twitter at 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)* 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.

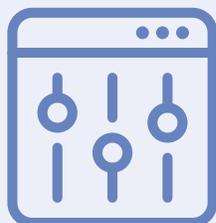
The Guidelines for Article 6 of the WHO FCTC state that increases in real prices reduce tobacco use (WHO, 2014). However, in recent decades, many low- and middle-income countries (LMICs) have seen rapid growth in incomes and inflation, and these increases in inflation and purchasing power can erode the 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.

Studies have found significant differences in cigarette affordability across countries, such that cigarette affordability was lower in high-income countries despite higher cigarette prices (Blecher & Van Walbeek, 2004, 2009; He et al., 2018). These studies have also found mixed trends in affordability across countries, with cigarettes becoming less affordable in some countries but becoming more affordable in others (Blecher, 2020). 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; 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.

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 absolute 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 absolute price component of the Scorecard.

Scoring criteria of affordability change in the Cigarette Tax Scorecard

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% average annual reduction < 7.5%
- 3: 2.5% 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.

However, there is some methodological debate regarding the best income measure to use. The present analysis uses GDP per capita following the method used in WHO reports on the global tobacco epidemic (WHO, 2015, 2017, 2019). 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. The provision of public goods and services such as education and healthcare is crucial in LMICS, where a large percentage of the population is dependent on them. 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 because 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 that for cigarettes.

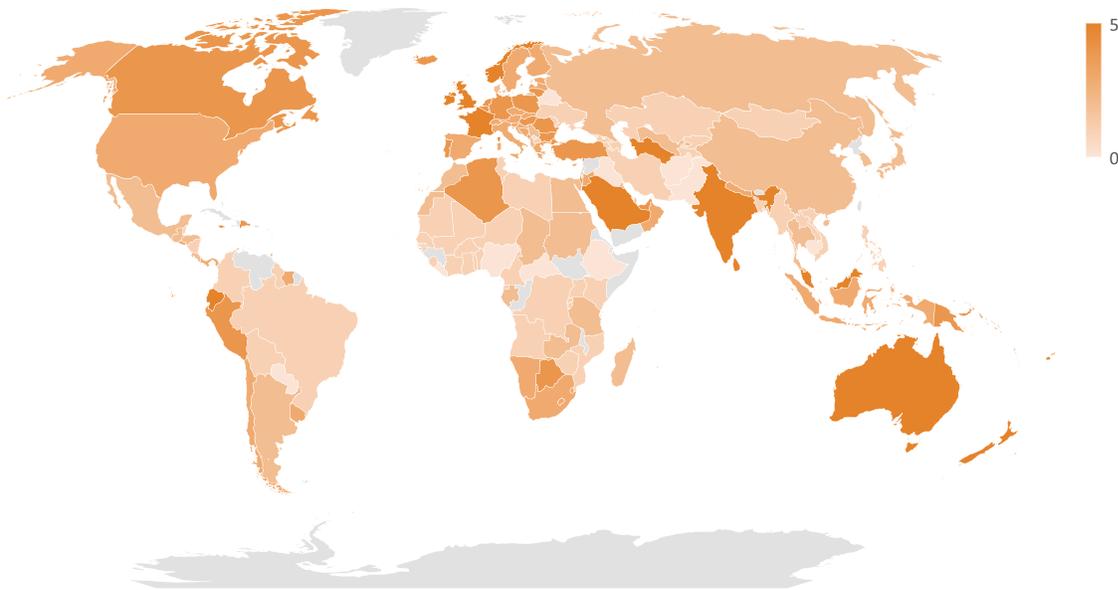
Despite these shortcomings, reducing the affordability of tobacco products is paramount to reducing tobacco use. Especially as countries experience rapid economic growth like many LMICs have experienced in the last two decades, increases in taxes that raise prices above both inflation and income growth 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 2018

Figure 1 presents a world map of the affordability change scores. In 2018, the average score on affordability across 186 countries observed was 1.18. Only 23 countries scored the highest score of five. The largest reduction in cigarette affordability happened in Saudi Arabia, where the average annual reduction was 19.9 percent, followed by Algeria (18.5 percent) and the Gambia (16.5 percent). Twenty-nine countries received a score between two and four, representing a statistically significant decrease in affordability over time accompanied by a tax increase. Australia, New Zealand, Ukraine, and a few other European countries fall into this category. Eleven countries, including Afghanistan, Kuwait, Oman, Qatar, and Venezuela, experienced a statistically significant fall in affordability but did not increase their cigarette taxes, thereby receiving a score of one. In comparison, 123 countries experienced either an increase in affordability or no statistically significant reduction in affordability, receiving a score of zero.

The affordability change score is the measure in the Scorecard for which countries are most likely to perform the worst.

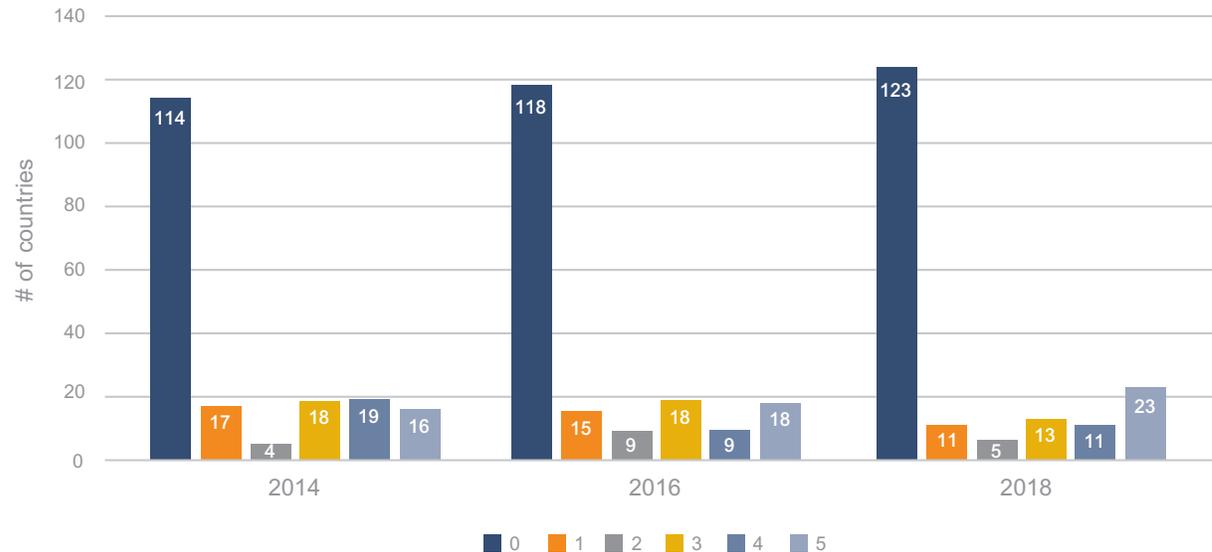
Figure 1 Affordability change scores, 2018



Affordability change score changes over time (2014–2018)

Few countries made significant progress over this period in terms of reducing the affordability of cigarettes (Figure 2). Despite a slight increase in the number of countries with the highest score (5), the number of countries scoring the lowest score (0) also increased.

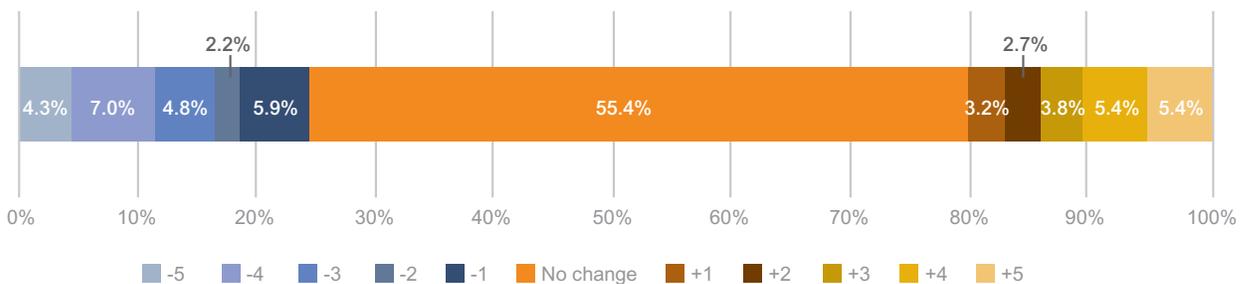
Figure 2 Evaluated countries by affordability change score and by year



Notes: Based on 188 countries in 2014, 187 in 2016, and 186 in 2018. For 186 countries scores are available in all three years. Source: Authors' calculations

Examining scores over time reveals that the majority of countries (55.4 percent) did not experience a change in score when comparing 2014 and 2018 (Figure 3). While 38 countries received higher scores in 2018, 45 performed worse over time. Malawi, Poland, Romania, and Spain are among those whose scores decreased from five to zero between 2014 and 2018. Conversely, Argentina, the Philippines, and Zimbabwe are among those whose scores changed from zero in 2014 to five in 2018.

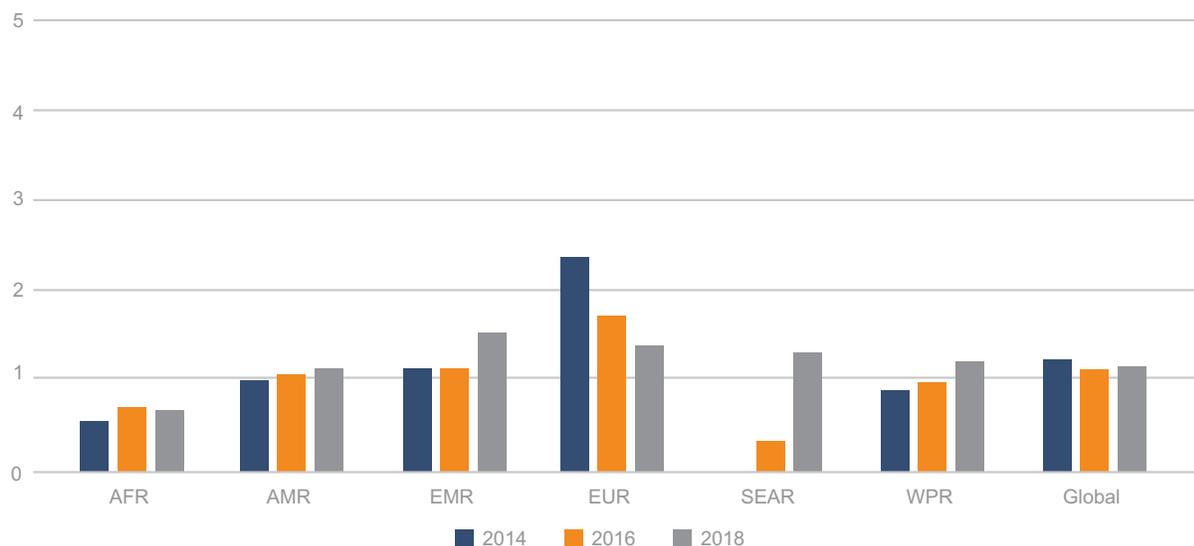
Figure 3 Percent distribution of score changes in affordability change between 2014–2018



Notes: Based on 188 countries in 2014, 187 in 2016, and 186 in 2018. For 186 countries scores are available in all three years. Percentages are calculated based on 186 countries where scores were available for both 2014 and 2018. Source: Authors' calculations

The global average score of affordability change decreased slightly from 1.25 in 2014 to 1.18 in 2018 (Figure 4). By WHO region, the average score increased the most in the region of South-East Asia, where the average score increased from 0.00 (2014) to 1.33 (2018). Countries in the European region saw a decrease in the average score from 2.40 (2014) to 1.40 (2018).

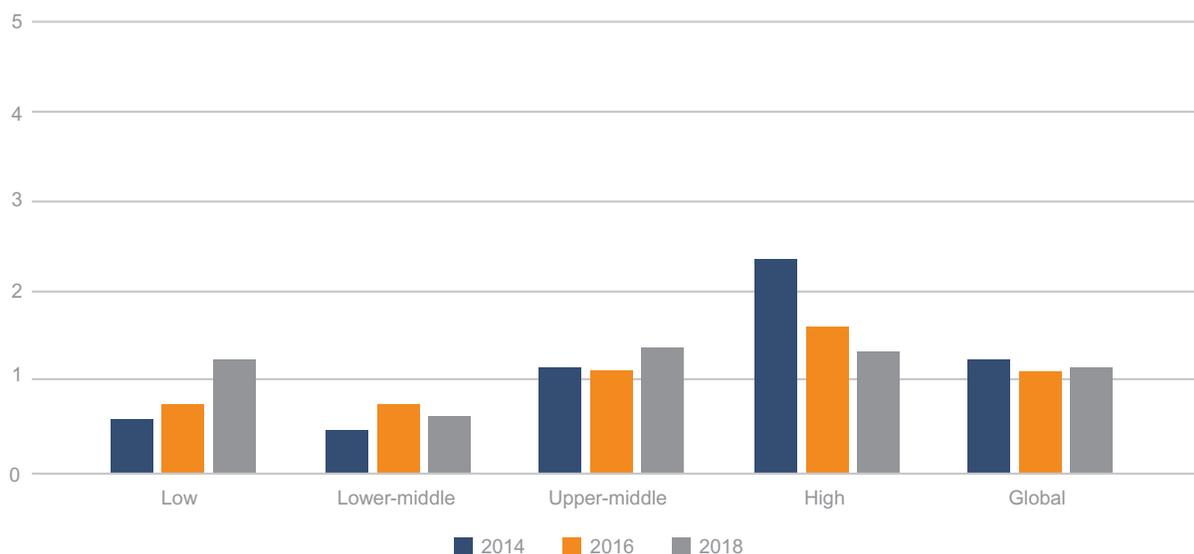
Figure 4 Average score on affordability change, by WHO region and by year



Notes: WHO regional grouping abbreviations are AFR = African Region, AMR = Region of the Americas, EMR = Eastern Mediterranean Region, EUR = European Region, SEAR = South-East Asian Region, WPR = Western Pacific Region. Based on 188 countries in 2014, 187 in 2016, and 186 in 2018. For 186 countries scores are available in all three years.
Source: Authors' calculations

Based on the World Bank country income groups, the largest increases in average scores were found in low-income countries, where the score increased from 0.58 (2014) to 1.28 (2018) (Figure 5). On the other hand, the largest decreases in the average score were observed in high-income countries, where the score decreased from 2.36 (2014) to 1.35 (2018).

Figure 5 Average score on affordability change, by World Bank income group and by year



Notes: Based on 188 countries in 2014, 187 in 2016, and 186 in 2018. For 186 countries scores are available in all three years.
Source: Authors' calculations

Policy recommendations

The Scorecard shows that there is ample room for improvement in the affordability change component. More than 40 percent of the countries scored the lowest possible score (0) in all three years. Even if countries impose higher taxes on cigarettes, changes in inflation and/or purchasing power often undermine those efforts and potentially even cancel out the impact of these taxes on smoking behavior. 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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