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Tobacco Taxes and Health Inequalities: Facts and Myths

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Executive Summary

The sixth Conference of the Parties to the WHO Framework Convention on Tobacco Control (FCTC) in October 2014 adopted guidelines on Article 6 concerning price and tax measures to reduce tobacco consumption. These guidelines include six guiding principles and 11 recommendations. This study evaluates the guiding principle 1.4, which claims:

"*Tobacco taxes are generally considered to be economically efficient as they apply to a product with inelastic demand. Low- and middle-income population groups are more responsive to tax and price increases; therefore consumption and prevalence are reduced in these groups by greater magnitudes than in higher-income groups, resulting in a reduction in health inequalities and tobacco-related poverty*," see WHO FCTC (2014).

Health inequalities are differences in health status between different population groups. Income is one among many possible dimensions of such inequalities. For example in the EU countries, individuals' self-reported health status increases with the level of education or income and both factors are clearly related. The reasons for health inequalities range from individuals' general socio-economic and political context, through to their social position and daily living conditions. This general framework influences individual lifestyle choices, which may include decisions with negative health consequences such as smoking, alcohol consumption, an unhealthy diet, physical inactivity and unsafe sexual behaviour. In this context, the influence of taxes on individual lifestyle decisions is limited and may differ between social groups.

This paper presents evidence on smoking behaviour of different social and income groups, for different countries. It shows that in nearly all EU countries individuals who categorise themselves into the lower-class smoke more than individuals who categorise themselves into the higher-class. An interesting finding from this study is that **the difference in the prevalence of smoking between classes increases with the tobacco tax level**. Evidence from different high tobacco tax countries – such as the EU countries, the US and Australia– shows that the gap between smoking prevalence of low and high income population groups widened during periods when tobacco taxes increased. **Therefore empirical evidence shows that, contrary to the claims of guiding principle 1.4, a tobacco tax increase is more likely to increase health inequalities than to reduce them.**

Individuals from lower income groups are more likely to smoke and spend a larger share of their income on tobacco products than higher income consumers. However, given that conventional definitions of poverty relate to income levels rather than to what use that income is put, the change in expenditures does not change poverty. Therefore, the concept of tobacco-related poverty is ill-defined and highly speculative. More important is the fact that low-income smokers who do not quit smoking in response to an increase in tobacco taxes have to pay higher taxes and so must reduce their consumption of other goods. Hence, if indeed there is anything like tobacco-related poverty, then it is to a large extent due to tobacco taxes. In the EU, for instance, average taxes on cigarettes (excise and VAT), account for around 80 per cent of the retail price, see European Commission (2015).

1 | Introduction

The sixth Conference of the Parties to the WHO Framework Convention on Tobacco Control (FCTC) in October 2014 adopted guidelines on Article 6 concerning price and tax measures to reduce tobacco consumption. These guidelines include six guiding principles and 11 recommendations. The WHO FCTC Article 6 guiding principle 1.4 says:

"*Low- and middle-income population groups are more responsive to tax and price increases; therefore consumption and prevalence are reduced in these groups by greater magnitudes than in higher-income groups, resulting in a reduction in health inequalities and tobacco-related poverty*."

To evaluate these claims, Section 2 defines health inequalities and looks into major reasons for such inequalities. Then Section 3 analyses the relationship between tobacco taxation and health inequality.

The claim made in the guiding principle 1.4 that tobacco tax and price increases reduce health inequalities is assessed using empirical evidence from different countries. The analysis focuses on western countries with high tobacco taxes because for these countries, relevant data is readily available. A comparison across EU countries and analyses of developments over time in individual countries show that higher tobacco taxes tend to increase health inequality rather than to reduce it. There is little evidence from our data to suggest that tobacco tax increases result in "*a reduction in health inequalities and tobacco-related poverty*" as claimed by the guiding principle 1.4.

2 | Health Inequalities

The WHO (2011) defines health inequalities as "*systematic differences in the health status of different population groups*". The WHO continues by saying that: "*There is ample evidence that social factors, including education, employment status, income level, gender and ethnicity have a marked influence on how healthy a person is. In all countries – whether low-, middle- or high-income – there are wide disparities in the health status of different social groups. The lower an individual's socio-economic position, the higher their risk of poor health*." Some health inequalities are attributable to biological variations or free choice. These are unavoidable. However, there are also health inequalities between groups of people within countries and between countries, which are avoidable. See Solar and Irwin (2010) for an extensive discussion of the different concepts.

There is a wide range of literature considering international and regional differences of health and their determinants. The differences between countries are largely due to income differentials. There are several transmission channels by which income affects health status, including the direct connection between income and health care expenditures and the cor-

relation of higher income with better working conditions. The Health Report of the European Commission (2013) shows that EU Member States with lower levels of social protection also tend to have higher rates of self-reported bad or very bad health. Furthermore, according to the report, countries with high income have in general an above average life expectancy while life expectancy in low income countries is well below average. Since health differentials between countries and regions are largely the result of different economic and social conditions, the following analysis focuses on health differences *within* countries.

The European Commission (2013) examined the extent of social differences in individual health across the EU. Two indicators were analysed: i) the relationship between self-reported health status and levels of education, income and deprivation; and ii) life expectancy and education. It is shown that self-reported "poor" or "very poor" general health and long-standing health problems are much more common among disadvantaged social groups than among most advantaged groups, regardless of whether education, income or material deprivation are used as social indicators. The closest connection to health is found for material deprivation. When the population is divided into five groups, then only five per cent of the least deprived population group reported poor or very poor general health conditions. For the most deprived quintile, the reported levels exceeded 20 per cent. For long-standing illness, comparable ranges were found.

The reasons for health inequalities range from individuals' general socio-economic, cultural and environmental conditions, through to their social position and daily living conditions. This general framework influences individual lifestyle choices, such as cigarette smoking, alcohol consumption, an unhealthy diet, physical inactivity and unsafe sexual behaviour; see European Commission (2013). However, all the higher layers constitute the general framework. In summary, two main conclusions can be drawn from these considerations: 1) There are many reasons for health inequalities between different income groups. 2) Different lifestyles and behaviours may contribute to heath inequalities. There is no direct link between taxation and lifestyle or behavioural decisions of different individuals from different income groups.

3 | Tobacco Taxation and Smoking Behaviour

This Section will analyse how tobacco taxation affects smoking behaviour of different income groups. The claim made in the guiding principle 1.4 of the FCTC Art. 6 is that a rise in the tax leads to an increase in the price of cigarettes, which reduces consumption. The effect is assumed to be more pronounced for low- and middle-income groups than for higher-income groups and therefore their tobacco consumption should fall more, reducing health inequalities.

It is widely known and acknowledged that lower social class and lower-income groups have higher smoking rates than higher social class and income groups. A WHO meta-analy-

sis has the main finding of a "*robust association between higher prevalence of current smoking and lower income levels*", see Ciapponi et al (2014, p 13). However, the guiding principle 1.4 seems to contradict this main finding.

The following sub-sections review the literature and present evidence on smoking behaviour of different social groups and classes for different countries. Sections 3.1.1 shows that in nearly all EU countries lower social class individuals do indeed smoke more than higher-class individuals. Furthermore, **the difference between smoking prevalence of social groups within countries increases with the tax level– see Figure 2**. Evidence from the UK, in section 3.1.2, indicates that the gap between smoking prevalence of individuals in occupational groups associated with higher and lower income has remained virtually the same or widened despite high tax increases. Section 3.1.3 shows that in Germany lower income groups spend a higher proportion of their income on tobacco than higher-income groups.

An econometric analysis for tobacco consumption in New York State, presented in section 3.1.4, shows that the price elasticity of low-income consumers is much lower than the price sensitivity of high-income consumers. Section 3.15 and 3.16 show that the same applies to Canada and to Australia. **Hence, all the evidence points to the fact that, contrary to claim of FCTC Article 6 guiding principle 1.4, a tobacco tax increase is more likely to increase health inequality than to reduce it.**

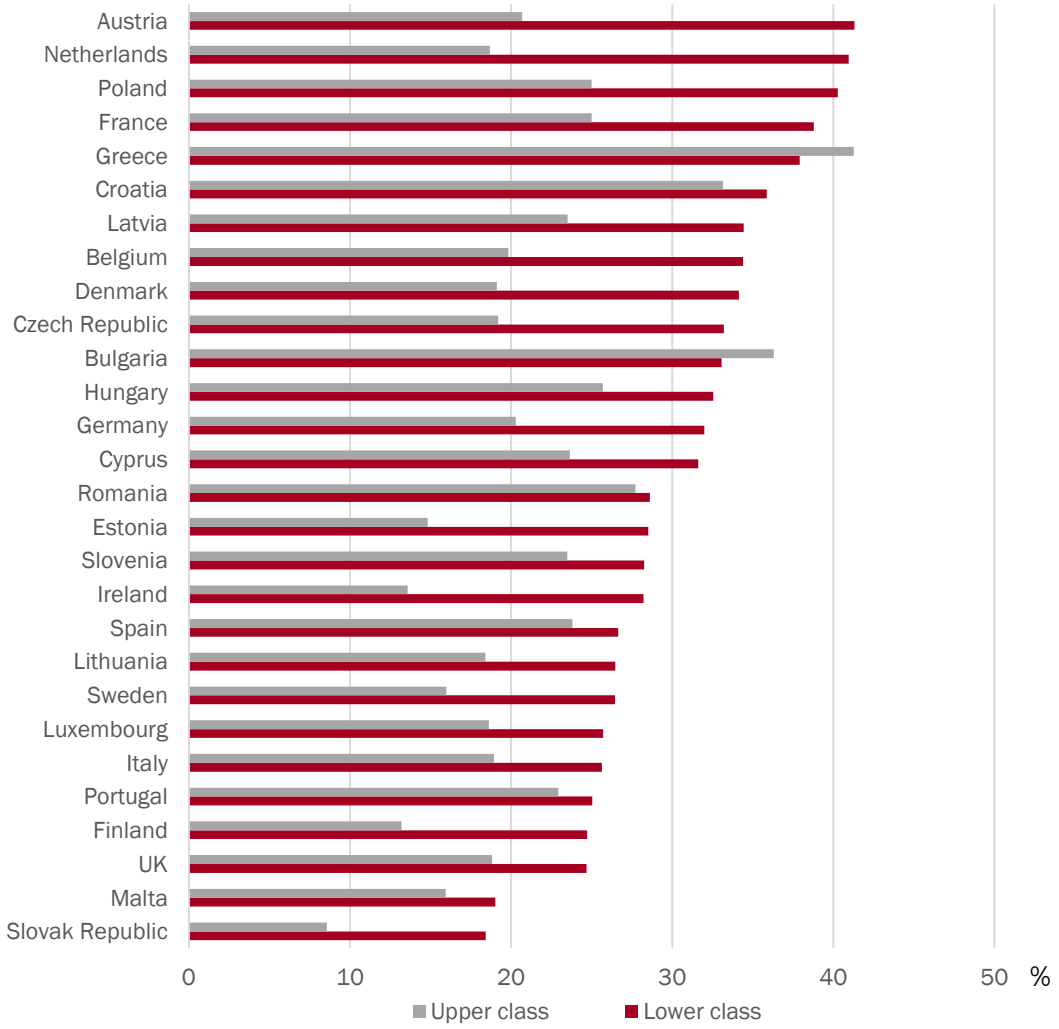
3.1 | Empirical evidence

3.1.1 | Evidence from the EU

Evidence for the EU can be derived from Eurobarometer, which is a survey conducted in all the EU countries. In December 2014 the survey included a special questionnaire regarding the smoking behaviour. In addition, the survey provides detailed information on the social status and education of respondents. There is no direct evidence on income but both education and social classes are highly correlated with income, see Rose and Harrison (2010) for a general discussion of social classes in Europe and Watson, Whelan and Maître (2010) as well as Noll and Weick (2011) for the correlation of income and social class.

At first, the correlation between social classes and smoking behaviour is considered. In the survey, individuals classified themselves into one of three social classes. Figure 1 shows the percentage of smokers in the upper and the lower social class.

Figure 1: Smoking Prevalence in Different Social Classes



Souce: European Commission & European Parliament (2015): Eurobarometer 82.4, 2014, ETR.

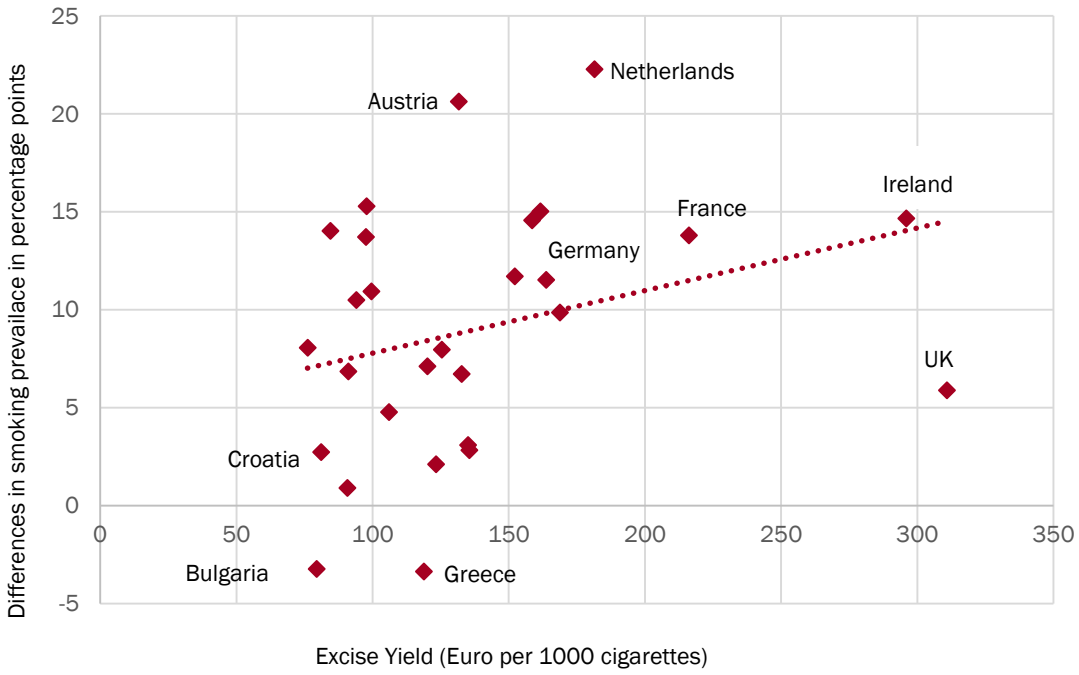
It is clear that there are large differences in smoking behaviour between and within EU countries. However, in nearly all countries, the percentage of individuals smoking is higher in the lower social class than in the upper social class. The difference is the largest in the Netherlands, where 41 per cent of the lower class population smoke compared to only 20 per cent of the upper class.

So far, it has been shown that lower class individuals are more likely to smoke than higher class individuals. Moreover, lower class individuals consume more cigarettes per day than upper class individuals, see Appendix. In addition, education is used as an additional social indicator. In all countries (except Italy), smoking is more common among lower-educated population groups than among higher-educated population groups.

It is interesting to consider the difference in smoking prevalence between different social groups and tobacco taxation. As noted above, the EU countries have high tax levels on tobacco products. On average taxes on cigarettes, which include excises and VAT, account for

around 80 per cent of the retail price, see European Commission (2015). Figure 2 shows a week but positive correlation between excise yields and the difference between percentages of smokers in upper and lower social classes. Hence, the difference in smoking prevalence between low- and high-income individuals increases with the level of tobacco excise duties.

Figure 2: Tobacco Taxation and Differences in Smoking Prevalence of Upper and Lower Social Classes



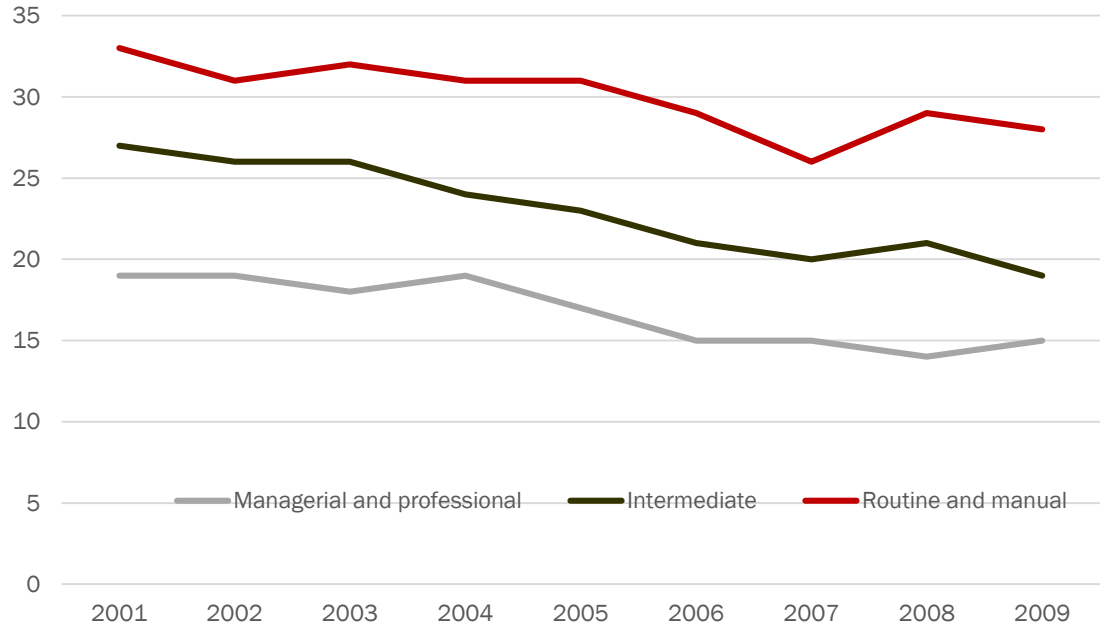
Souce: European Commission & European Parliament (2015): Eurobarometer 82.4, 2014, ETR.

One of the highest differences between smoking prevalence of different classes is observed in Ireland, which has one of the highest excise yields on cigarettes. In contrast, those countries where the upper social class smokes slightly more than the lower social class are countries with lower excise duties on cigarettes. All these facts contradict the claim of the guiding principle 1.4.

3.1.2 | Evidence from the UK

Smoking behaviour of different groups of individuals is regularly monitored within the General Household Survey (GHS). The survey constantly shows remarkable differences in cigarette smoking prevalence of different socio-economic groups. Smoking is significantly more common among individuals in manual-labour groups than among individuals in non-manual groups. Comparisons over time show that the differences between the groups have become proportionately greater since the 1970s, see Robinson and Harris (2011). Figure 3 shows the trends of smoking prevalence in England during the period 2001 to 2009.

Figure 3: Prevalence of cigarette smoking by socio-economic classification of the household reference person



Source: Robinson and Harris (2011), ETR.

Throughout the period, smoking prevalence of individuals pursuing a routine and manual work was the highest compared to individuals in intermediate, and managerial and professional job categories. In general, individuals in the category of managerial and professional work have higher income than individuals in the intermediate job category, which in turn have higher income than workers in the category of routine and manual work. During the period 2001-2009, tobacco excises increased by more than 28 per cent, see HM Revenue and Customs (2013). According to the guiding principle 1.4, this increase should have led to a decline in smoking prevalence of manual working individuals that should exceed the decline in smoking prevalence of workers with intermediate jobs and jobs in the managerial and professional category. However, the decline in smoking prevalence was nearly the same for individuals in the managerial and professional as well as routine and manual categories (-4 and -5 percentage points, respectively), while the largest decline was observed for individuals with intermediate jobs (-8 percentage points). Despite high tax increases and the highest excise tax on cigarettes in the EU, smoking prevalence remains the highest for individuals in the routine and manual group as it has not declined notably faster or even less than for higher socio-economic classes.

3.1.3 | Evidence from Germany

Considering the effects of social classes and education groups on smoking prevalence the evidence for Germany is very similar to the UK; see Lampert and Koch (2010). Lower class and lower-educated individuals are more likely to smoke than better-educated or higher class individuals and differences between social classes and education groups increased over time. Since social classes and education levels translate into different income levels this contradicts guiding principle 1.4. Table 1 shows the smoking prevalence of male individuals living in different households and different income groups. In all types of households smoking prevalence declines with the level of income.

Table 1: Smoking prevalence of male individuals in different household and different income groups in per cent

Household income	Household type			
		Couple		
per month	Singe	no children	with children	Total
< 900	52.4	33.5	53.6	50.4
900 – 2000	39.4	21.0	49.0	33.7
2000 – 2900	31.8	23.0	37.3	30.1
2900 – 4000	25.6	23.9	29.7	27.4
4000 – 5000	24.0	20.9	23.2	24.4
5000 – 6000	25.5	18.9	19.5	21.3
> 6000	23.7	17.3	17.5	19.9

Source: German Mikrozensus 2009, ETR.

Table 2 shows the tobacco related expenditures for households of different income groups. It is important to note that household expenditures are referred to the averages of households with and without smokers and in households with couples there may be one or two smokers. The data shows that even absolute expenditures for tobacco in higher income groups are lower than in the lower income groups. For example: A single man with an income between 900 and 1300 Euros per month spends on average 22.59 Euros for tobacco products. A single man with an income above 5000 Euros spends only 8.79 Euros on average. The same pattern holds true for couples with or without children. Higher expenditures also imply a higher tax burden. To judge the distributional effects, the tax burden has to be related to household income. From Table 2 it follows that expenditures for tobacco in relation to income are much higher in households with low incomes than in households with high incomes. This clearly shows that low-income households are willing to bear the burden of tobacco taxes, which is in contradiction to the claims of guiding principle 1.4.

Table 2: Expenditures for Tobacco Products of Different Households

Household income Euro/Month	Expenditures for tobacco in Euros per month by type of household			Expenditures for tobacco in per cent of household income by type of household		
	single man	couple no children	couple two children	single man	couple no children	couple two children
< 900	18.14			2.65		
900 – 1300	22.59	22.84		2.06	2.04	
1 300 – 1500	22.60	17.99		1.62	1.28	
1 500 – 2000	20.66	20.78		1.19	1.18	
2 000 –2600	17.87	20.42	35.83	0.79	0.89	1.53
2 600 –3600	15.87	20.70	22.65	0.52	0.68	0.72
3 600 –5000	11.08	14.94	18.84	0.26	0.36	0.44
5 000 –18000	8.79	17.73	9.30	0.13	0.25	0.13

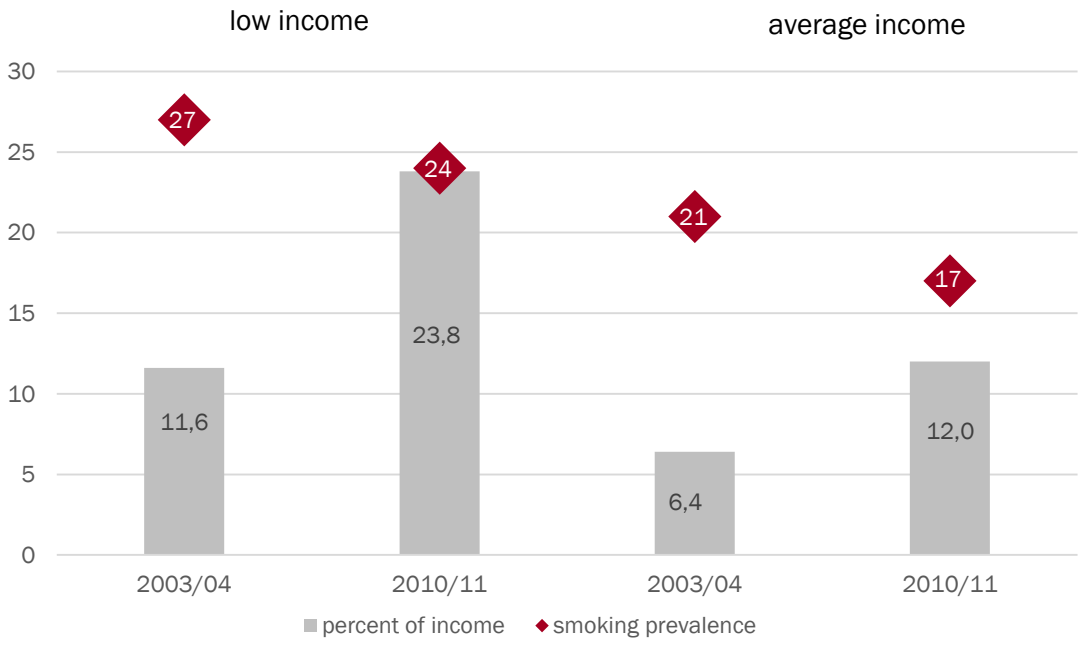
Source: German income and expenditure survey, 2008, ETR.

3.1.4 | Evidence from the US

Using data from the New York and the national Adult Tobacco Surveys from 2010–2011, Farrelly, Nonnemaker and Watson (2012) estimate how smoking prevalence, daily cigarette consumption, and the share of annual income spent on cigarettes vary according to annual income. Smoking prevalence in New York and nationwide is strongly related to income. In the lowest income group smoking prevalence is two to three times higher than in the highest income group.

The analysis in this study compares smoking prevalence and spending on smoking for different income groups in the year 2003/04 and 2011/12. During the period, tobacco excise duties at the state level increased from $1.5 to $4.35 per packet, see Federation of Tax Administrators (2015). As a result, tobacco expenditures by low-income individuals increased from 11.6 per cent to 23.8 per cent of income; see Figure 4. For individuals earning average incomes, the percentage of income allocated to smoking is much lower. However, the effect on smoking prevalence is higher. For average income individuals, the percentage of smokers declined from 21 to 17 per cent, while for low-income individuals it declined from 27 to 24 per cent. Hence, the smoking prevalence gap between average and low-income individuals widened from 6 to 7 percentage points. This again contradicts the claim made in the guiding principle 1.4.

Figure 4: Smoking prevalence by income group in New York State



Source: Farrelly, Nonnemaker, Watson (2012).

Moreover, another result of the high excise tax in New York State is that the state exhibits the highest illicit trade and cross-border shopping of all US states, see LaFaive, Nesbit, Drenkard (2015). In 2013 the state excise tax was $4.35 and 58 per cent of cigarette consumption in New York State came from illicit supplies. In the year 2006, with a state excise tax of $1.5, the share of illicit supply was significantly lower (35.8 per cent), see Drenkard and Henchman (2015).

3.1.5 | Evidence from Canada

Between 1985 and early 1991, the Canadian federal excise tax on cigarettes increased by 107.3 per cent. The federal excise tax was raised again in February 1991, to $19.14 per carton (all prices are in real 2002 Canadian dollars; see Gabler and Katz (2010)). This rate remained in effect until October 1994, when it was reduced to $7.29 per carton. The tax rate did not increase significantly until 1999. By the end of 1999, the federal excise tax had reached $9.41 per carton. By 2001, a series of tax increases reflecting a renewed attempt to discourage smoking across Canada had pushed cigarette taxes up. In 2002 it reached $15.85 per carton. See Gabler and Katz (2010) for a detailed analysis of Canadian tobacco taxation history. Therefore, Canadian survey data for the years 1999 to 2002 allows welfare and distributional effect of high tobacco prices to be investigated. Gospodinov and Irvine (2009) use these data to estimate price elasticities. They provide clear evidence that despite high tax increases, the price elasticity of low-income consumers is considerably lower than that

for high-income consumers. Table 33 shows that the high-to-low elasticity pattern runs from high-income to low-income individuals. The study concludes that tobacco taxes are regressive.

In the early 1990s, high tobacco taxes induced a very high illegal supply on the Canadian market; see Gruber, Sen and Stabile (2003) and Gospodinov and Irvine (2005) for econometric studies of this process. Then, in 1994, taxes were reduced dramatically, before they started to rise again in the late 1990s. Therefore, the grey and illegal markets started to grow again; see Gabler and Katz (2010). An increase in grey market activities is likely to have the largest effect on low-income individuals whose time costs are least. As a result, their price elasticity for legal cigarettes may be higher than for higher income consumers. However their elasticity concerning overall consumption, including for illicitly supplied cigarettes, is lower. This indicates that smoking prevalence of lower-income consumers will decline less in response to a tax increase than that of higher-income consumers. Thus, the tax increase leads to a rise in health inequalities.

Table 3: Estimated Price Elasticities of Tobacco Demand for Different Income Groups

low income group	– 0.332
low-middle income group	– 0.683
middle income group	– 0.596
middle-high income group	– 0.557
high income group	– 0.711
all income groups	– 0.540

Source: Gospodinov and Irvine (2009)

3.1.6 | Evidence from Australia

"Tobacco in Australia: Facts and Issues, A comprehensive online resource" clearly states that tobacco use is more prevalent in low socio-economic groups than in high groups, see Scollo and Winstanley (2012). In addition, quit rates are lower, and the duration of smoking is longer. Furthermore, the online resource says: "*There is no doubt that this (a tobacco tax increase) creates a large financial burden in many low-income households*"; see Chapter 13: The pricing and taxation of tobacco products in Australia. Figure 5 shows that smoking prevalence is lower for higher-educated groups. Furthermore between 2001 and 2010, smoking prevalence has declined more for the higher-educated groups than for lower-educated groups. Hence, health inequalities increased while taxes went up.

Figure 5: Smoking Prevalence by Education Group

Source: Scollo and Winstanley (2012), ETR.

3.2 | Explanations and consequences

The empirical evidence clearly indicates that smoking remains more common in lower-socio-economic class, lower-education and lower-income population segments and that smoking prevalence declines at a slower rate for these population groups. All the countries included in the analysis have relatively high tobacco excise duties. However, contrary to the claim in the guiding principle 1.4, the gap between smoking prevalence of low- and high-income groups has not narrowed or even widened. This can only be the case if the price elasticity of tobacco demand in low-income groups is lower than in other population groups. Lower price elasticities imply that the difference in smoking prevalence between low- and high-income individuals increases when taxes rise.

Tobacco demand depends not only on income and prices but also on a number of other factors, such as culture or social norms. These factors change very slowly and do not respond directly to tax changes. Laaksonen et al. (2005) examined socio-economic differences in smoking, by using several indicators that reflect different dimensions of socioeconomic position. They found smoking to be associated with the structural, material as well as the perceived dimensions of socio-economic disadvantage, and they conclude that attempts to reduce smoking among the socio-economically disadvantaged need to target several dimensions of their socio-economic position.

The empirical evidence presented above shows that individuals from lower-income groups are more likely to smoke. In addition, low-income individuals spend a larger share of their income on tobacco products. By definition some individuals in the very low-income group can be classified as "poor". There are claims that if these individuals would stop smoking, income previously used for smoking could be used for other consumer goods. However,

conventional definitions of poverty relate to income and not consumption. Saving tobacco expenditures does not change income or poverty. In contrast to measures of poverty, measures of deprivation do not relate on income but to how people live. Deprivation is the consequence of a lack of resources for the consumption of certain goods. To find out whether an individual is deprived, one has to define a set of consumer goods individuals necessarily have to consume if they are able to. Since tobacco is not regarded as a fundamental necessity, quitting smoking releases resources for necessity goods. However, it is far from certain that a person who stops smoking uses the freed income for those goods, which are regarded as a necessity. In short, the concept of tobacco related poverty, addressed in the guiding principle 1.4, is ill-defined, and therefore statements about tobacco-related poverty are very hypothetical.

Even Action on Smoking and Health (ASH), a prominent public health charity in the UK, acknowledges that "*poorer smokers who don't quit are disproportionately disadvantaged because of the negative impact of tobacco tax increases on their already small incomes*" (ASH, 2015). The evidence clearly indicates that low-income smokers are less likely to stop smoking in response to increasing tobacco taxes and prices. Tobacco taxes account for a large share of cigarette's price. In many countries taxes on tobacco account for much more than 50 per cent of the tobacco price and in the EU it is around 80 per cent on average. So if there is anything like tobacco-related poverty it is, to large extent, due to tobacco taxes. To summarize, the claim in the guiding principle 1.4 that tobacco taxes reduce "tobacco-related poverty" lacks theoretical coherence and empirical support.

4 | Conclusion

The empirical evidence presented in this paper shows that in countries with high tobacco duties individuals of lower social origins and lower income groups are much more likely to smoke than individuals of higher income groups. Furthermore, the evidence across countries shows that the difference in smoking prevalence between low- and high-income individuals is higher in countries with high tobacco excise duties than in countries with low tobacco duties. Indeed, as excise taxes have increased, smoking prevalence has not declined more quickly among low-income individuals than among high-income individuals. Therefore, the claim in the guiding principle 1.4 that tobacco taxes reduce health inequality is not supported by empirical evidence.

Guiding principle 1.4 also claims that tobacco taxation reduces "tobacco-related poverty". However, there is no direct link between smoking and conventional definitions of poverty or deprivation. Furthermore, it is important to note that taxes on tobacco account for much more than 50 per cent of the tobacco price in many countries (around 80 per cent, for the EU countries). Hence, if there is anything like "tobacco-related poverty" it should be attributed as a tobacco tax-related poverty. In summary: the guiding principle 1.4 is not based on any evidence or the actual social experiences of the Parties to FCTC.

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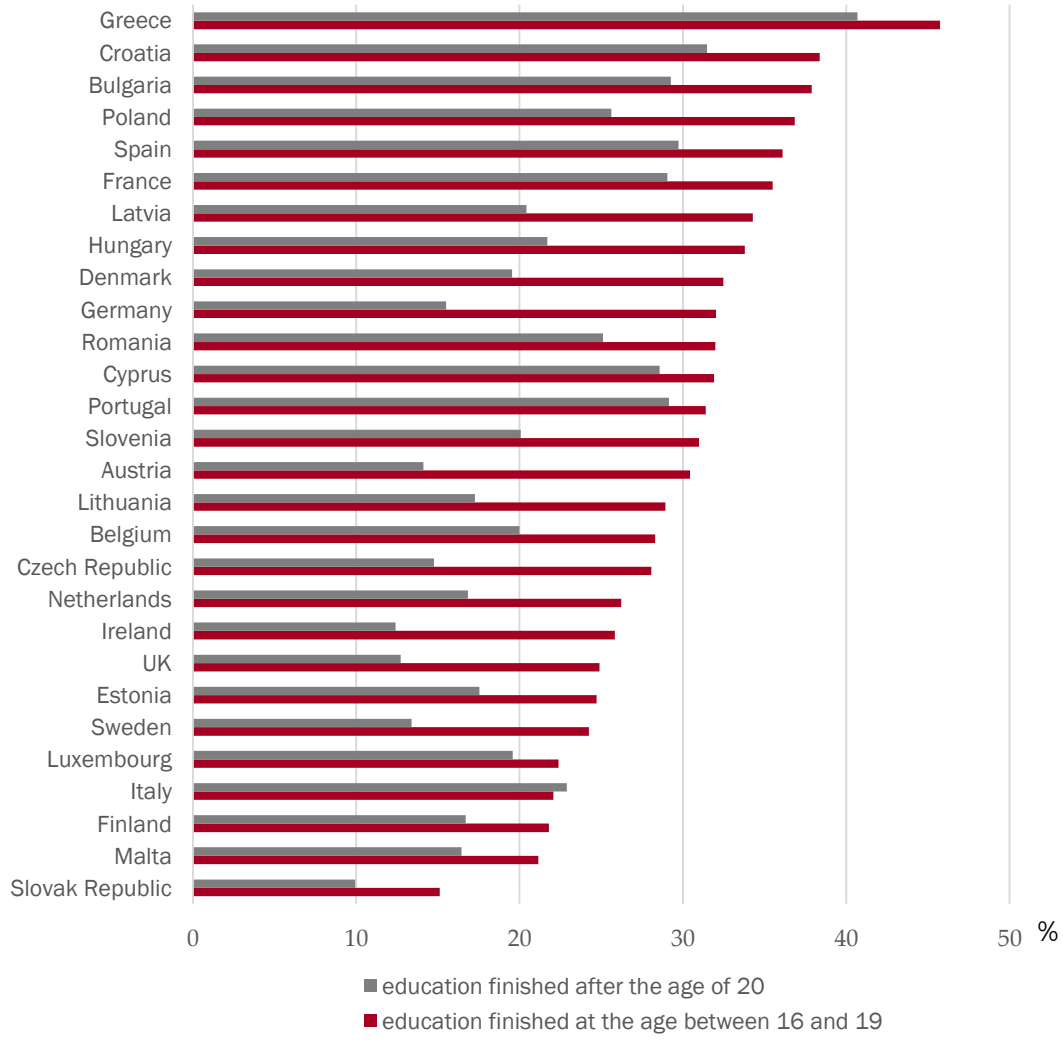
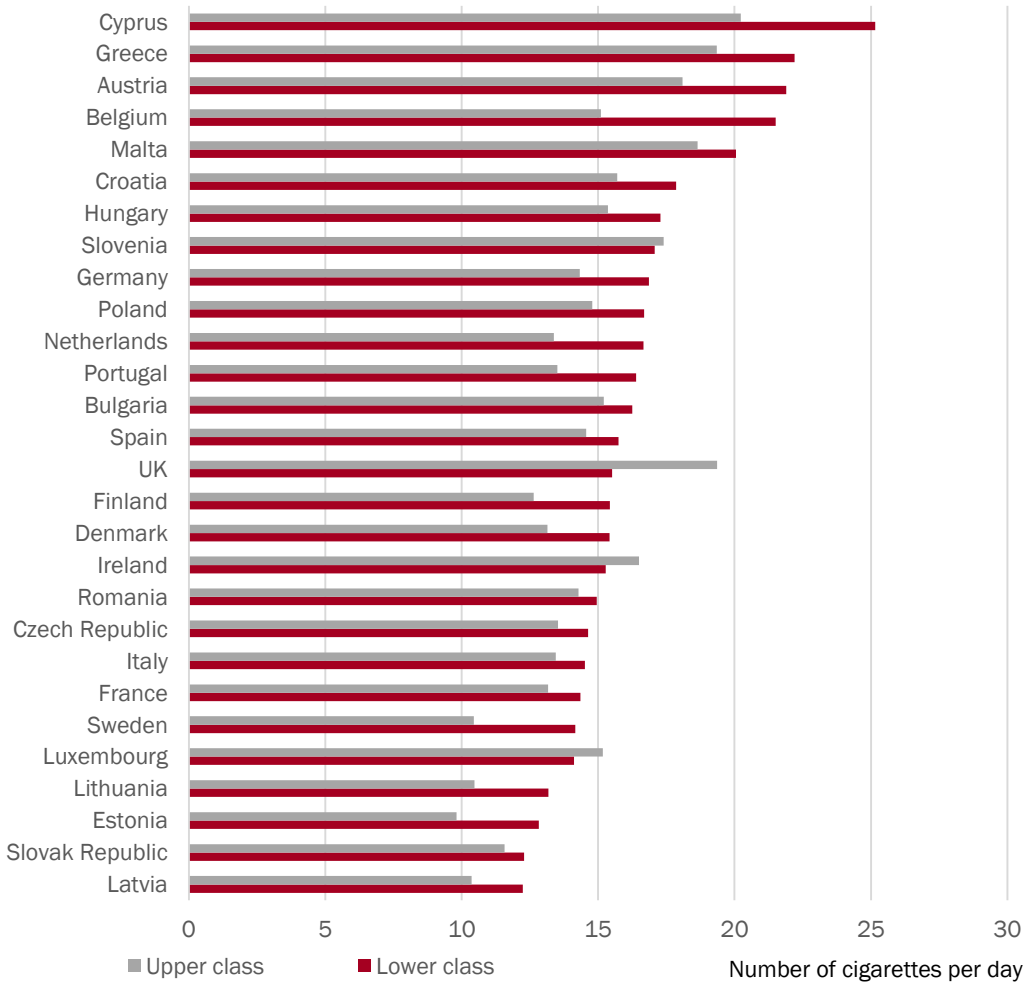
Appendix

Figure A1: Smoking prevalence by education



Sources: Data 2014, European Commission & European Parliament (2015), Eurobarometer 82.4, ETR.

Figure A2: Cigarette Consumption in Different Social Classes



Sources: European Commission & European Parliament (2015): Eurobarometer 82.4, 2014, ETR.

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