PART 2.

MECHANISMS AND CONTEXT UNDERLYING SOCIAL INEQUALITIES IN CANCER

EXAMPLE 1.

Tobacco-related cancers and taxation of tobacco in low- and middle-income countries

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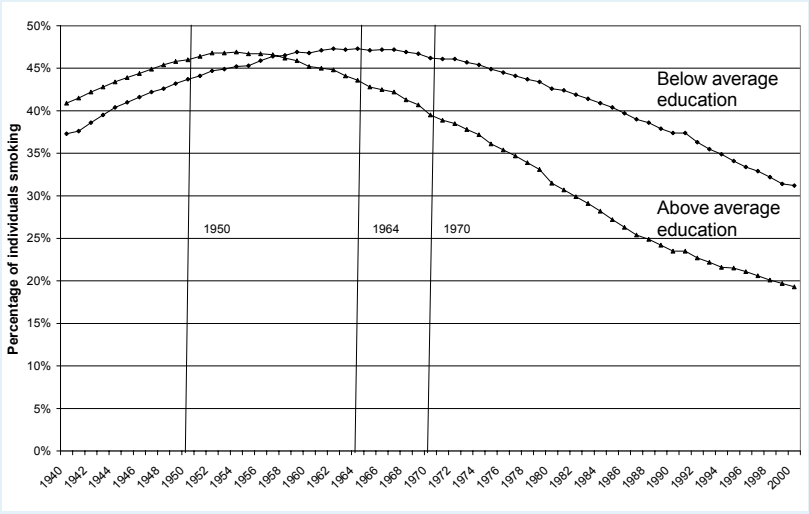
Introduction

Tobacco smoking remains the most important avoidable cause of cancer deaths worldwide, accounting for about one third of all cancer deaths in men and about 6% of all cancer deaths in women (Jha, 2009). Smoking will kill about 1 billion people this century if current patterns hold (Jha and Peto, 2014). Chewing tobacco adds to the total, accounting for a substantial proportion of oral cancer deaths in men and women, particularly in South Asia (Gupta and Johnson, 2014; Khan et al., 2014). The toll will be heaviest among groups with lower socioeconomic status (SES) in many countries. Fortunately, both smoking prevalence and its consequences can be reduced by interventions that are feasible in any country (Jha and Peto, 2014; Jha et al., 2015).

In most high-income countries (HICs), such as the USA, smoking prevalence has been declining since the early 1970s. Current smoking prevalence and the rates of smoking-attributable diseases are highest in groups with lower SES (Singh et al., 2011), with similar smoking prevalence rates in men and women. Historically, however, smoking prevalence rates were higher in groups with higher SES. Over time, the wealthier quit or did not start, whereas people in groups with lower SES continued to smoke. This has reversed the initial SES gradient in smoking, evident when using smoking rates by education level as an indicator among USA adults (Fig. E1.1).

Fig. E1.1. Trends in prevalence of smoking of those aged 25 years and older by relative education level in the USA, 1940–2000. Smoking histories were constructed from various rounds of the National Health Interview Surveys. Each individual is classified as above or below the average educational achievement in each year for individuals aged 25 years and older in that particular year. Source: reproduced with permission from de Walque (2004).



The same transition seems to be taking place in most low- and middle-income countries (LMICs); the decades-long lag in this transition is due to the later start of the smoking epidemic (Palipudi et al., 2012). A major difference is that relatively few women have taken up smoking in LMICs; the smoking epidemic is therefore largely limited to men (Jha, 2009; Jha and Peto, 2014). As a result, tobacco-attributable deaths are still rising among men in LMICs, whereas they have been falling substantially for three decades among men in HICs (Peto et al., 1994).

In this example we review the relationship between tobacco and social inequalities in cancer and overall mortality. We then examine the impact of tobacco control interventions, most notably tobacco taxation, in reducing inequalities in cancer and other diseases, focusing on the evidence in LMICs.

Relationship between smoking and social inequalities, and trends over time

Given that within most countries the poor smoke more than the rich, it follows that the diseases made more common by smoking – including various cancers (notably of the lung and respiratory system, oesophagus, and others) and cardiovascular and respiratory diseases – are also more common among the poor than among the rich (Singh et al., 2011).

A method has been developed (Peto et al., 1994) to crudely estimate the contribution of smoking-attributable deaths by SES (Jha et al., 2006). For example, in 1996 in Canada, England and Wales, Poland, and the USA, there was an approximately 2-fold difference between the highest and the lowest social strata in overall risks of dying among men aged 35–69 years. At least half of the differences in mortality risks between groups with highest and lowest SES were attributable to deaths from smoking. Smoking therefore accounted for about half of the difference in social inequalities in overall mortality (Fig. E1.2).

The substantial decline in smoking prevalence in many HICs enables us to examine how this change affects social inequalities over time and to quantify the contribution of smoking. Fig. E1.3 shows the trends in mortality in men aged 30–69 years among the poorest and richest quintiles (based on neighbourhood income) in Ontario, Canada, from 1992 to 2012. Ontario has a population of about 12 million and is reasonably representative of the trends among adult men in HICs.

Over this 20-year period, the risk of death from any cancer was about 50% higher among the poorest men than among the richest men, and the risk of premature death from tobacco-attributable cancers in

Fig. E1.2. Social inequalities in mortality in men aged 35–69 years in 1996 from smoking (dark shading) and from any cause. Source: reprinted from Jha et al. (2006), copyright 2006, with permission from Elsevier.

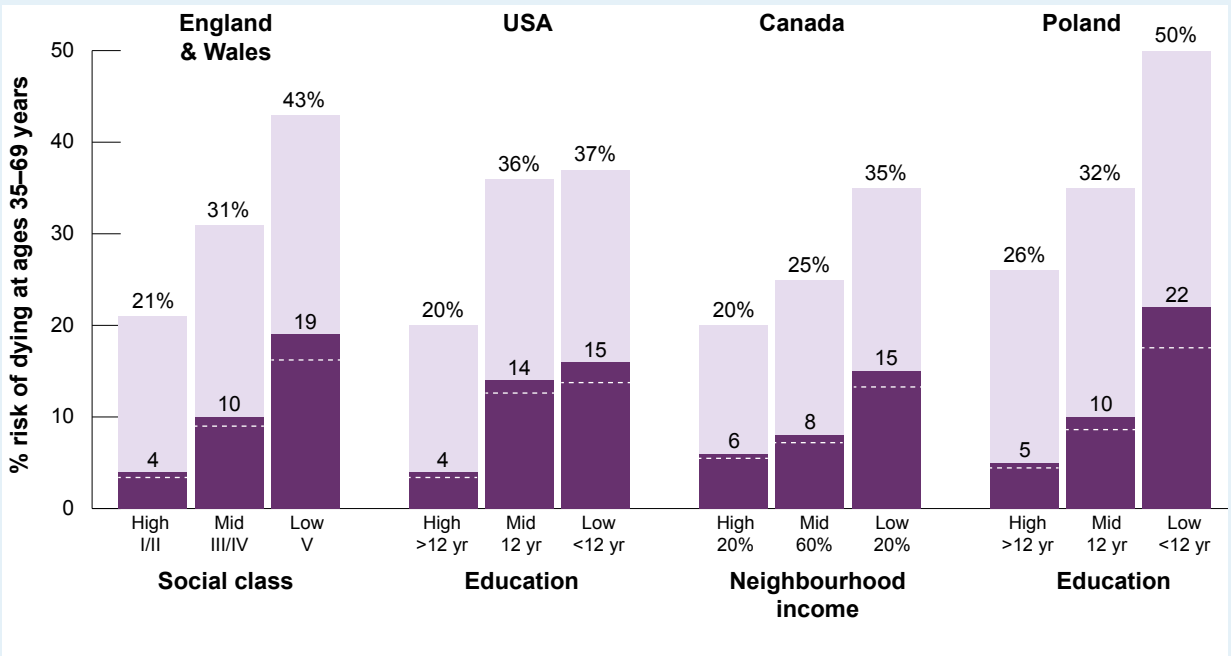
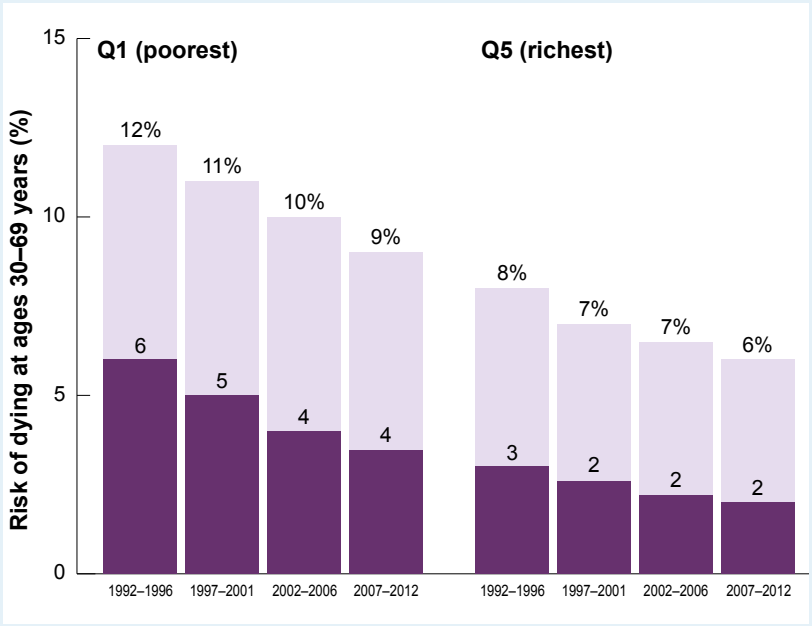


Fig. E1.3. Comparison of mortality rates from cancer in men aged 30–69 years during 1992–2012 from smoking (dark shading) and from any cancer in Ontario, Canada, by income quintile.



the poorest men was double that in the richest men. The risks have evolved over the period, correlating with previous changes in smoking patterns. During 1992–1996, the beginning of the period, this absolute gap in risk of death from any cancer between poorest and richest was 4% (12% − 8%), and tobacco contributed to about three quarters (6% − 3% = 3%) of this difference. By 2007–2012, the absolute gap had fallen to 3% (9% − 6%), and tobacco contributed to two thirds (4% − 2% = 2%) of the difference. From 1992 to 2012, the risk of death from cancer fell by about one quarter in both the poorest (3%/12%) and the richest (2%/8%) quintile of men. Reduced tobacco-attributable cancer deaths contributed to two thirds of the decline in the poorest men (2%) and half (1%) in the richest men. Thus, in Ontario, declines in tobacco-attributable cancers have reduced the absolute inequalities between the richest and poorest men in cancer mortality.

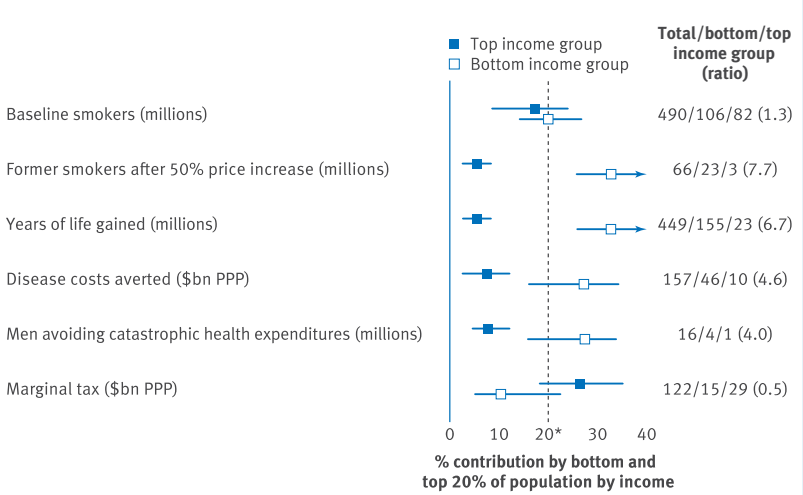
The main reasons for the declines in smoking-attributable cancer mortality in HICs and the differences by SES have not been extensively studied, but a range of cost-effective interventions have probably contributed to declines. These interventions may be classified into price instruments, which focus on large increases in excise taxes on tobacco, and non-price instruments, which include bans on smoking in public places, bans on advertising and promotion, prominent warning labels or the use of plain packaging, and widespread dissemination of information on tobacco and support for cessation (including pharmacotherapies) (Jha and Peto, 2014; Jha et al., 2015). If these provisions, which are part of the World Health Organization Framework Convention on Tobacco Control (the global treaty to reduce tobacco use), were implemented widely, tobacco consumption in LMICs would also fall (Jha, 2009; Jha and Peto, 2014).

Effects on social inequalities in LMICs from increases in tobacco taxes

Tobacco taxation is the most effective practicable intervention to increase smoking cessation rates and to prevent young people from initiating smoking (Jha, 2009; IARC, 2011; Jha and Peto, 2014; additional information on tobacco taxation in Chapter 11).

In most LMICs, the absolute total of tobacco-related illnesses is still increasing and effective large tobacco tax increases have not yet been widely used. The most relevant evidence for what taxes could accomplish – evidence that could be used to persuade policy-makers of the health and financial benefits of higher taxes – has been generated from robust models. A recent analysis (Global Tobacco Economics Consortium, 2018) examined the health, poverty, and financial consequences of a 50% increase in cigarette price among 500 million male smokers in 13 middle-income countries: six lower-middle-income countries (Armenia, Bangladesh, India, Indonesia, the Philippines, and Viet Nam), and seven upper-middle-income countries (Brazil, Chile, China, Colombia, Mexico, Thailand, and Turkey). The price increase would lead to substantially greater health and financial gains for the lowest-income quintile compared with the highest-income quintile (Fig. E1.4). Some key findings include: the life years gained in the lowest-income quintile were 7 times those in the highest-income quintile, out of 450 million life years gained in the 13 countries; the average life years gained per

Fig. E1.4. Expected value of health and financial benefits gained by the lowest-income and highest-income quintiles of the population in 13 middle-income countries as a result of a 50% increase in cigarette price. PPP, purchasing power parity. * Expected value if no differences exist across bottom and top income groups. Source: reproduced from Global Tobacco Economics Consortium (2018).



smoker in the lowest-income quintile were 5 times those in the highest-income quintile; and the cost of treatment averted in the lowest-income quintile was 5 times that in the highest-income quintile, of a total of US$ 157 billion.

If tobacco taxes were increased, about 16 million men (most of whom are in the lowest-income quintile) and their families in the subset of seven countries without universal health coverage would avoid catastrophic health expenditures. The men and their families would also avoid the related income loss from their incapacitation and, for their families, from their death. As result, 8.8 million men, half of whom are in the lowest-income quintile, would avoid falling below the World Bank definition of extreme poverty. In contrast, the highest-income quintile would pay twice as much as the lowest-income quintile of the US$ 122 billion additional tax collected.

The prevailing wisdom among some economists and public health groups has been that higher tobacco taxes hurt the poor more than the rich, based on the observation that low-income smokers spend a disproportionately greater share of their income on tobacco than high-income smokers do. However, at the population level, the health benefits are strongly concentrated in poorer (pre-tax) smokers as a consequence of their reduced tobacco use. Viewed through a public health lens, higher tobacco taxes are pro-poor (Jha and Chaloupka, 1999; Hosseinpoor et al., 2011; Sassi et al., 2018).

Higher taxes generate higher revenues that may be used to improve health and other social services for the poor, such as expanding basic services under universal health coverage (Jha et al., 2015). Tax increases must be implemented with care to avoid substitution effects (see Chapter 11) (Marquez and Moreno-Dodson, 2017).

Effective population tobacco control requires a comprehensive approach, including a set of proven interventions in addition to taxation. Table E1.1 summarizes the impacts of effective non-price interventions and the likely responsiveness to these by groups with lower and higher SES. Groups with lower SES will respond more to excise taxes but are less likely to take up health information. Regulatory interventions, such as bans on tobacco advertising and promotion and bans on public smoking, are likely to be effective across groups with different SES. Cessation interventions are more likely to be taken up by individuals with higher

Table E1.1. Interventions to reduce tobacco use, and likely impact among groups with higher and lower socioeconomic status (SES)[a].

Intervention	Low SES	High SES
Higher cigarette taxes	+++	+
Consumer information, prominent warning labels, or plain packaging	+	++
Bans on advertising and promotion and on smoking in public	++	++
Nicotine replacement therapy, electronic nicotine delivery systems (e.g. e-cigarettes), and cessation	+	++

[a] Impact is assessed qualitatively based on the number of + signs assigned.

Source: compiled from Jha and Peto (2014). License: Creative Commons Attribution CC BY 3.0 IGO.

SES (Jha and Peto, 2014; Jha et al., 2015). All of these interventions should be considered in national anti-smoking plans, but large increases in the excise tax have been demonstrated to have the biggest effect. Indeed, as cigarettes are becoming more affordable (Jha, 2009; Jha and Peto, 2014; Chapter 11), it is unlikely that non-price interventions alone will reduce tobacco consumption substantially.

Conclusions

Tobacco use is the root cause of a substantial proportion of social inequalities in the risk of death from cancer and a host of other smoking-related causes. Reductions in tobacco use have helped to reduce the absolute inequalities in cancer mortality in HICs, with reductions in smoking-attributable cancers playing a greater role in the reduced mortality rates among the poorest smokers. A worldwide tripling of the excise tax would reduce consumption by at least one third and avoid about 200 million premature deaths in the first half of this century (Jha and Peto, 2014). Globally, large increases in the excise tax, paired with strategies to reduce substitution to shorter, cheaper cigarettes, could substantially reduce consumption and improve the health of the poor, including reducing social inequalities in cancer mortality.

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