# The economics of tobacco control: evidence from the International Tobacco Control (ITC) Policy Evaluation Project

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### **ABSTRACT**

Over the past few decades, the importance of economic research in advancing tobacco control policies has become increasingly clear. Extensive research has demonstrated that increasing tobacco taxes and prices is the single most cost-effective tobacco control measure. The research contained in this supplement adds to this evidence and provides new insights into how smokers respond to tax and price changes using the rich data on purchase behaviours, brand choices, tax avoidance and evasion, and tobacco use collected systematically and consistently across countries and over time by the International Tobacco Control (ITC) Project. The findings from this research will help inform policymakers, public health professionals, advocates, and others seeking to maximise the public health and economic benefits from higher taxes.

Over the past few decades, the importance of economic research in advancing tobacco control policies has become increasingly clear. Evidence on the impact of tax and price increases on tobacco use is needed in order to determine the revenue and public health effects of excise tax increases. To maximise these effects, one needs to understand the advantages and limitations of alternative types of tobacco tax structures. Objective data on the extent and determinants of tax avoidance and tax evasion are needed to address concerns that higher taxes and other tobacco control policies will lead to illicit tobacco markets and to identify the most effective approaches to tax administration. The importance of economic research is clear from the emphasis on economic research in nearly all the tobacco control research priorities identified by the WHO (2010) as part of its non-communicable disease research agenda setting process that included:

- ▶ Research to estimate the impact of tax and price policies, including developing country-specific price elasticity estimates, differential impact, tax structure and effective tax administration to curb tax avoidance and tax evasion.
- ▶ Research to improve cessation interventions, including adaptation of interventions effective in high-income countries to low-income and middle-income countries, identification of most cost-effective interventions for resource-constrained countries, and integration of cessation into health systems.
- ▶ Research to assess the economic impact of tobacco use and to evaluate the economic impact of tobacco control (eg, on jobs, health-care costs and productivity).

- ▶ Research on the inter-relationships between tobacco use and poverty, including the role of tobacco use in causing poverty, and compromising other spending, and the differential effect of tobacco control policies and programmes on the poor.
- ▶ Research to develop messages effective in overcoming misinformation spread by tobacco companies, building/strengthening social norms against tobacco, and building support for tobacco control policies and programmes.
- ► Finally, in the subset of countries with high economic dependence on tobacco, research on developing economically viable alternatives to tobacco growing and manufacturing.

The economic research contained in this supplement addresses many of these issues, taking advantage of the unique data collected in the International Tobacco Control Policy Evaluation Project (ITC Project). The ITC Project is a transdisciplinary collaboration of over 100 researchers across 22 countries: Canada, USA, UK, Australia, Ireland, Thailand, Malaysia, Republic of Korea, China, Mexico, Uruguay, New Zealand, France, Germany, The Netherlands, Mauritius, Brazil, Bangladesh, Bhutan, India, Kenya and Zambia. The primary objective of the ITC Project is to evaluate the effectiveness of current tobacco control policies and to provide evidence for governments to assess the possible need for stronger policies; and then when new policies are implemented, to evaluate them over time and in comparison with other ITC countries where those policies have not changed during that same period of time. Conducting parallel surveys in countries being compared is known as a quasi-experimental design or 'natural experiment' design. This type of research design provides rigorous evaluation of the psychosocial and behavioural effects of national level tobacco control policies of the Framework Convention on Tobacco Control (FCTC). The ITC Project is conducting large-scale annual prospective cohort surveys of tobacco use to evaluate FCTC policies in countries inhabited by over half the world's smokers. Each ITC Survey includes key measures for each FCTC policy domain that are identical or functionally similar across all ITC countries to facilitate cross-country comparisons.

In the decade since the ITC Project was founded (2002), there have been over 90 survey waves conducted across the 22 countries. The resulting data, through the project's scientific publications and reports, have been used to evaluate FCTC implementation by countries across many domains of the treaty, including health warnings (pictorial

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Several of the papers in this supplement assess the impact of cigarette taxes and prices on various aspects of smokers' behaviour, including cigarette consumption, purchase behaviours, brand choice and tax avoidance, as well as on how these behaviours differ by socioeconomic status. Nargis et al<sup>1</sup> use data from the first two waves of the ITC-Bangladesh survey to estimate the price elasticity of cigarette demand, concluding that a 10% increase in price would reduce overall demand by about 6%, with about two-thirds of the reduction accounted for by reduction in smoking prevalence. Consistent with experiences in many countries, they also find that cigarette consumption among people of lower socioeconomic status is more responsive to price than consumption among higher socioeconomic groups. Huang et al<sup>2</sup> find that price is a key factor in brand choice for many urban Chinese smokers, particularly lower income and less educated smokers, while higher income and more educated smokers are more likely to take advantage of the quantity discounts that can be obtained by buying in cartons. Similarly, Yao et al<sup>3</sup> conclude that younger and lower income Chinese smokers were more likely to buy cheaper cigarettes for economic reasons, suggesting that reducing the availability of cheaper cigarettes in China is essential for achieving significant reductions in smoking. Cornelius et al<sup>4</sup> present evidence for the USA, showing that the percentage of smokers using discount brands increased from 2002 to 2011, with female, lower income and heavier smokers more likely to choose discount brands. By contrast, Cowie et al5 find that brand choices in Australia have been relatively stable over time, despite increasingly strong constraints on tobacco marketing, with about 80% of Australian smokers remaining brand loyal from 2002 through early 2012. They do, however, observe differences in brand loyalty in various population subgroups, with younger smokers, lower income and more addicted smokers less brand loyal than their older, higher income and more addicted counterparts.

The importance of tax structure in driving smokers' behaviours, including brand choice, is demonstrated in papers using ITC data from diverse countries, including China, Canada, Mexico and the USA. Shang et al6 use recent data on brand choice and prices paid reported by smokers in 16 ITC countries to examine how the use of uniform versus tiered taxes and of specific, ad valorem and mixed tax structures affects the distribution of cigarette prices, concluding that uniform specific tax structures result in less variability in prices. White et al<sup>7</sup> show that the wide variation in prices that results from the mixed tax structure used in China that consists of a very small uniform specific tax and a tiered ad valorem tax that accounts for most of the total tax helps explain changes in brand choice by Chinese smokers over time, particularly trading down to cheaper brands. By contrast, Nargis et al<sup>8</sup> find that the uniform specific tax structure used in Canada and the USA leads continuing smokers to trade up to premium brands given the increase in the price of discount brands relative to premium brands following an increase in the specific tax. Sáenz de Miera Juárez *et al*<sup>9</sup> find that the same sort of trading up occurred in Mexico, in this case to international brands, following the sharp increase in the specific component of its mixed cigarette tax in 2011 that resulted in a relatively larger increase in the prices of domestic brands compared to international brands.

The remaining papers explore issues of tax avoidance and tax evasion. Guindon et al<sup>10</sup> use data from ITC surveys conducted in 16 countries to assess the extent of tax avoidance and evasion over time and across countries, finding that the prevalence of avoidance/evasion differs considerably across countries, from relatively little in many countries, including Australia, Thailand, The Netherlands, Ireland, Scotland and Mexico, to relatively high rates in others, including Canada, the UK, Malaysia and China. Nagelhout et al11 use the ITC surveys conducted in western European countries from 2006 to 2008 to explore the determinants of cross-border cigarette purchases, concluding that smokers near borders with lower tax/price countries, particularly those in France and Germany, were most likely to avoid taxes by crossing borders, with more educated and higher-income smokers more likely to engage in cross-border shopping. Fix et al<sup>12</sup> report findings from a novel approach to assessing tax avoidance/evasion in which smokers participating in the ITC-USA surveys in 2009 and 2010 were invited to mail back cigarette packs. Based on the difference between the tax stamp on the packs collected and respondents' state of residence, they estimate that more than one in five packs returned had avoided or evaded state taxes. Finally, in their reanalysis of the US Food and Drug Administration's (USFDA) estimates of the impact of Canada's graphic warning labels on smoking prevalence, Huang et al<sup>13</sup> show that failing to account for the lower prices that result from widespread tax avoidance and evasion can lead to erroneous conclusions about the effectiveness of other tobacco control policies. They conclude that the USFDA's analysis that relied on official prices that do not reflect opportunities for tax avoidance/evasion attributed too much of the decline in smoking prevalence in Canada to increasing taxes and prices and, as a result, the USFDA significantly underestimated the potential impact of graphic warning labels in the USA.

The research covered in this supplement is important. The findings will help inform policymakers, public health professionals, advocates, and others seeking to maximise the public health and economic benefits from higher tobacco taxes and prices.

### What this paper adds

- ► The research contained in this supplement provides new insights into how smokers respond to tax and price changes using the rich data on purchase behaviours, brand choices, tax avoidance and evasion, and tobacco use collected systematically and consistently across countries and over time by the International Tobacco Control (ITC) Project.
- ► The findings from this research will be of interest to policymakers, public health professionals, advocates, and others seeking to understand and take full advantage of the public health and economic benefits from higher tobacco taxes.

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# 烟草控制经济学:源自国际烟草控制政策评估项目(ITC)的证据

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# 摘要

过去几十年里,经济研究对于推进控烟政策的 重要性越来越明显。大量研究表明提高烟草税 和烟草价格是最有效的控烟措施。本刊中的文 章为该论证增添了论据,运用涉及购买行为、 品牌选择、避税和逃税以及烟草使用的丰富数 据对吸烟者如何对烟草税和烟草价格的变化作 出反应提供了新的见解。这些数据是国际烟草 控制项目(ITC)在多个国家之间系统地、划 一标准地、随时间推移连续收集的。研究中的 这些发现将帮助决策者、公共卫生专业人员、 控烟政策拥护者和其他人了解如何从更高的烟 草税中实现公共卫生和经济效益最大化。

过去几十年里,经济研究对于推进控烟政策的 重要性越来越明显。为了确定消费税增加对税 收和公共健康的影响,需要收集证据证明提 高烟草税和烟草价格对烟草使用的影响。要最 大化这些效应,研究者首先要理解各类烟草税 结构的优点和局限之处。需要关于避税和逃税 的范围和决定因素的客观数据,以解除提高税 费和其他烟草控制政策将导致非法的烟草市场 的担忧,同时确定最有效的税务管理方式。经 济研究的重要性是毋庸置疑的。几乎所有的 烟草控制研究都强调经济研究的重要性。这些 研究重点是世界卫生组织(2010)所设置的 非传染性疾病课题的一部分,包括以下研究课 题:

- ▶ 评估烟草税收和价格政策影响的研究,包括特定发展中国家价格弹性估计,影响的差异,能抑制避税逃税行为的税收结构和有效的税收管理制度。
- 改善戒烟干预的研究,包括从高收入国家 到中低收入国家干预措施的有效性,为资 源有限的国家找到最具成本效益的干预措 施,以及将戒烟整合进卫生系统。
- ▶ 研究评估烟草使用和烟草控制的经济影响 (如就业,医疗成本和生产力)。
- ▶ 研究烟草使用和贫困之间的相互关系,包括烟草使用在导致贫困和侵蚀其他支出中的作用,以及控烟政策和项目对穷人的不同影响。
- ▶ 研究开发能够有效抑制烟草公司传播错误

- 信息的措施,建立/加强抵制烟草的社会规范,建立对控烟政策和项目的支持。
- ▶ 最后,对于在经济上高度依赖烟草的部分 国家,研究发展在经济上可行的行业以替 代烟草种植和生产。

本刊中的各项经济研究利用国际烟草控制 政策评估项目 (ITC Project) 所收集的独有数 据,涉及到了上述所提到的众多课题。ITC项 目由来自22个国家100多名研究者组成的跨学 科团队协作开展,这些国家包括:加拿大,美 国,英国,澳大利亚,爱尔兰,泰国,马来西 亚, 韩国, 中国, 墨西哥, 乌拉圭, 新西兰, 法国,德国,荷兰,毛里求斯,巴西,孟加 拉,不丹,印度,肯尼亚和赞比亚。ITC项目 的首要目标是评估当前控烟政策的效果,以及 给政府提供相关证据以评估更强有力的政策的 必要性; 而且当新的政策得以执行时, 要评估 它们随时间推移的效果,并与同时期其他没有 改变控烟政策的ITC国家进行比较。在正在被 比较的国家间进行平行调查被认为是类实验设 计或"自然实验"设计。这种类型的研究设计 对《烟草控制框架公约》 (FCTC) 国家层面 的控烟政策的社会心理和行为影响提供了严格 的评估。ITC项目正在大规模开展烟草使用的 年度前瞻性队列研究,以评估居住着超过世界 一半的吸烟者的国家的FCTC政策。每个国家 的ITC调查都包括对FCTC各项政策领域的测 量指标,在所有参与ITC的国家中这些指标都 是相同的或具有类似的功能以便进行国家间的

ITC项目成立(2002)以来的十年内,已 在22个国家间开展了超过90次的调查。通过该 项目的科学出版物和报告,研究数据已经被用 于评估各国对FCTC中诸多条款的履行情况, 包括健康警示(澳大利亚、加拿大、墨西哥、 乌拉圭、巴西、泰国、马来西亚、毛里求斯的 图形警示标识)、无烟法令(如,爱尔兰、苏 格兰、英国、法国、德国、荷兰、中国、毛里 求斯、印度、墨西哥、乌拉圭、巴西、泰国、 马来西亚)、限制/禁止广告、促销和赞助的法 令(如,加拿大、美国、英国、澳大利亚、泰 国、马来西亚、乌拉圭、中国)、非法贸易和 降价促销策略(如,加拿大、美国、法国、德 国、荷兰、乌拉圭)、增加吸烟和二手烟危害 信息传播的策略(如,马来西亚、毛里求斯、 墨西哥、中国)以及本刊的关注点,烟草价格/ 税收政策。

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本刊中的一些论文评估了卷烟税和卷烟价格对吸烟者 行为各个方面的影响,包括卷烟消费、购买行为、品牌选 择和避税、以及社会经济地位如何使这些行为产生差异 。Nargis等人们使用国际烟草控制孟加拉调查的最初两轮调 查数据估计了卷烟的需求价格弹性,认为价格增加10%能使 总需求降低6%,其中约有2/3的降低是通过降低吸烟流行率 来实现的。和很多国家的卷烟消费经验一致,他们也发现社 会经济地位较低的人群比社会经济地位较高的人群对价格更 加敏感。Huang 等人[2]发现对于许多中国城镇吸烟者,尤其 是低收入和低教育的吸烟者,价格是品牌选择的一个关键因 素,而收入较高和受过更好教育的吸烟者更可能会利用数量 折扣。这种折扣可以通过购买整条卷烟获得。Yao等人[3]得 出相似的结论: 更年轻、收入更低的中国吸烟者更可能因为 经济原因购买廉价卷烟,暗示在中国减少廉价卷烟的可及性 对于有效降低烟草使用至关重要。Cornelius等人中展示了美 国的证据:从2002年到2011年,使用低价品牌的吸烟者百 分比增加了, 女性、低收入者和重度吸烟者更可能选择低价 品牌。相比之下, Cowie等人[5]发现尽管对烟草营销的限制 越来越严,在澳大利亚卷烟品牌的选择一直相对稳定:从 2002年到2012年初大约80%的澳大利亚吸烟者仍保持对品 牌的忠诚。然而,他们也观察到不同群体在品牌忠诚度上的 差异: 年轻、低收入且烟瘾更大的吸烟者比年龄较大、高收 入且烟瘾较小的吸烟者品牌忠诚度更低。

本刊利用来自包括中国、加拿大、墨西哥和美国在内的 不同国家的ITC数据,论证了税收结构在改变包括品牌选择 在内的吸烟者行为的重要性。Shang等人问运用最近的由16 个ITC国家的吸烟者报告的品牌选择和支付价格的数据研究 了单一税收结构相对于分级税收结构,以及从量税、从价税 和混合税收结构对卷烟价格分布的影响,结果表明单一从量 的税收结构导致更少的价格变化。White等人们揭示了中国 的混合税收结构导致的广泛价格变异。该混合税收结构包含 一个非常小的统一从量税部分和一个分级的从价税部分。此 结构有助于解释中国烟民长期以来在品牌选择上的变化,特 别是转向廉价品牌的趋势。相比之下,Nargis等人[8]发现加 拿大和美国的统一从量税收结构导致吸烟者持续购买高端品 牌,因为随着单一从量税的增加,低价品牌相对于高端品牌 的价格会增加。Sáenz de Miera Juárez等人[9]发现墨西哥也 有同样类型的购买上升趋势。2011年在墨西哥随着混合烟 草税收结构中从量税份额急剧上升,国内品牌的价格相比国 际品牌有相对更大的增长,吸烟者转而购买国际品牌。

其他论文探究了避税和逃税的问题。Guindon等人[10]运 用在16个国家进行的ITC调查中获得的数据评估了随着时间 推移和国家间的不同避税和逃税的程度,发现避税/逃税的 流行率在国家之间有很大不同,从很多国家(包括澳大利亚 、泰国、荷兰、爱尔兰、苏格兰和墨西哥) 相对较小的流 行率,到其他国家(加拿大、英国、马来西亚和中国)相 对较大的流行率。Nagelhout等人[11]运用从2006年到2008 年在西欧国家进行的ITC调查,探究了跨国购买卷烟的决定 因素,结论是:居住在低税收/价格国家国界附近的吸烟者 , 尤其是在法国和德国的烟民, 更有可能会通过跨国购买 来避税; 受过较高教育和收入较高的吸烟者更可能参与跨 国购买。Fix等人[12]报告了来源于一个新的评估避税/逃税方 法的研究结果,邀请2009年和2010年参与ITC美国调查的 吸烟者邮回烟盒。基于所收集烟盒上的印花税票与研究对 象所居住州之间的不同,他们估计收到的烟盒中超过1/5有 避税或逃税。最后,Huang等人[14]对美国食品药品监督管理

局(USFDA)的分析报告—加拿大图形警示标识对吸烟流行率的影响—进行了再分析。研究显示如未考虑普遍的避税和逃税所导致的低价会得出有关其他控烟政策有效性的错误结论。他们认为USFDA的分析报告过多的将加拿大吸烟流行率的降低归因于税收和价格的增加,而此分析报告依赖于不能体现避税/逃税因素的官方价格。由此导致的结果是USFDA明显低估了图形警示标识在美国的潜在影响。

本刊中涉及的研究十分重要。这些研究发现将帮助政策制定者、公共卫生专家、控烟政策拥护者和其他人了解如何 从更高的烟草税中实现公共卫生和经济效益最大化。

## 本文贡献

- ▶ 本刊中的文章运用涉及烟草使用、购买行为、品牌选择、避税逃税的丰富数据就吸烟者如何应对烟草税和价格的变化提供了新的见解。这些数据是ITC项目在多个国家之间系统地、划一标准的、随时间推移连续收集的。
- ▶ 该研究的发现是政策制定者、公共卫生专家、控烟政策拥护者和其他人关注的焦点,并可以帮助他们了解如何从更高烟草税中实现公共卫生和经济效益最大化。

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