致香港特別行政區財政司司長公開信
大幅增加煙草稅　速降香港吸煙率

自吸煙 (公眾衛生) 條例於 1982 年實施以來，政府一直以多管齊下的方式推行控煙工作，以保障公共健康。根據主題性住戶統計調查第 53 號報告書，雖然香港的吸煙率在 2012 年下降至有紀錄以來最低的 10.7%，然而仍然有 645,000 人有每天吸煙的習慣，而部份群組如中年人士和女性的吸煙人數更輕微上升。

煙草使用對市民及社會整體均是一項沉重的負擔。吸煙不但令香港每年近 7,000 人死亡，更引致大量經濟損失包括龐大的醫療開支和生產力損失 **(附件 A)**。世界衛生組織 (世衛) 的研究指出每兩個吸煙人士當中，最少一個會因吸煙而死亡，因此，減低煙草使用即可以拯救無數寶貴的生命。

為了對抗煙草流行，世衛推出六項有效控煙措施「MPOWER」，並建議所有《煙草控制框架公約》締約方實行，其中增加煙草稅被確認是最有效減低煙草使用及鼓勵戒煙的控煙措施之一。

預防兒童及青少年吸煙

在社會各界的支持下，香港多年來積極推行預防吸煙的教育及宣傳工作，令青少年的吸煙率處於低水平，但 2012 年的主題性住戶統計調查發現小學生的吸煙率卻輕微上升。

世界銀行證實青少年對於煙草價格特別敏感。根據香港大學李嘉誠醫學院公共衛生學院發表有關煙草稅對青少年吸煙的研究，2009 年及 2011 年增加煙草稅後，青少年吸煙率從 2008 年的 6.9%下降至 2010 年的 3.4%及至 2012 年的 3%，成功防止超過 13,000 名及 3,000 名青少年吸煙或促使他們停止吸煙，足以證明提高煙草稅對防止青少年開始吸煙有正面作用。

加強戒煙決心

提高煙價能夠同時減低吸煙人士對煙草的需求及鼓勵他們戒煙。在 2009 年及 2011 年財政預算案宣佈增加煙草稅後，衛生署的綜合戒煙熱線分別收到超過 15,000 及 20,000 個查詢戒煙輔導的來電，年度升幅達 258%及 49%。

香港吸煙與健康委員會 (委員會) 早前進行的「控煙政策調查 2014」發現，受訪者認為每包捲煙零售價提升至平均 106 元 (即比現時價格高 51 元)，才可以有效推動吸煙人士戒煙。現在吸煙者更認為有效推動戒煙的價格平均應為 171 元，比已戒煙者 (123 元) 及從不吸煙者 (98 元) 所建議的更高。以上結果充份顯示香港的煙草稅率有上調空間，政府應該大幅度增加捲煙價格以加強吸煙人士戒煙的決心。

公眾支持提高煙草稅及煙價

「控煙政策調查 2014」亦發現大部份受訪者 (65.3%) 認為去年煙草稅的溫和升幅 (每包增加 4 元)，未能有效幫助吸煙者戒煙。大多數受訪者 (72.9%) 均支持每年增加煙草稅，以保持價格對減低煙草需求的作用，當中認為增幅應該高於通脹的更達 48.1%。

相對其他已發展國家，香港的捲煙價格偏低，如澳洲 (25 支裝的捲煙每包為港幣 132 元)、紐西蘭 (港幣 106 元)、英國 (港幣 105 元) 及新加坡 (港幣 70 元)。根據煙草控制經濟學國際著名學者羅夏麗博士分析，1989 年至 2013 年期間，香港捲煙的實際格價上升僅 25%，遠低於通脹的增幅。經調整收入後的實際價格更反而下降 14%。相對西太平洋地區的國家如澳洲、馬來西亞、新加坡及泰國，香港吸煙人士購買捲煙的可負擔能力相對較高。

增加煙草稅與私煙活動並無關連

煙草商經常以私煙問題為由反對增加煙草稅。菲利普莫里斯亞洲集團資助牛津經濟研究院及國際稅務和投資中心對亞洲各國 2012 年及 2013 年的私煙使用情況進行研究，指香港走私煙佔捲煙總消耗量近三分之一，然而有關研究向煙草商偏斜，其研究方法令人懷疑。世衛總幹事陳馮富珍博士於二零一四年十月揭露國際稅務和投資中心實為煙草業所贊助，企圖影響各國的煙稅政策和削弱控煙工作上的能力 **(附件 B)** ，《煙草控制框架公約》締約方應謹慎處理甚至否定國際稅務和投資中心和其他與煙草業有關聯機構提出的數據。

牛津經濟研究院及國際稅務和投資中心的研究誇大了香港的私煙情況，委員會與香港大學使用具透明度的計算方法及可信賴的數據評估香港的私煙消耗量，以不同官方機構的數據客觀地推斷 2012 年香港的私煙佔捲煙總消耗量約 8.2%至 15.4%，中位數為 11.9%。評估已經英國醫學期刊 (British Medical Journal) 審閱，相關論文 "Did the tobacco industry inflate estimates of illicit cigarette consumption in Asia? An empirical analysis"在 2015 年 1 月刊登於旗下學術期刊《煙草控制》(Tobacco Control) **(附件 C)**。

世衛不少研究均已證明增加煙草稅與私煙並無必然關係，事實上不少煙草稅低的國家亦存在嚴重私煙問題，反之亦然。增加煙草稅是為了防止吸煙行為，聲稱增加煙草稅會引致嚴重私煙問題實為混淆視聽，以凍結煙草稅作為解決私煙問題亦欠缺理據及效用。香港海關在2011年4月8日的立法會會議上曾指出「私煙市場並沒有因該次增加煙草稅措施而有惡化跡象」(LC Paper No. CB(2)1419/10-11(01))，加強執法是打擊私煙問題最有效的方法。

促請政府當機立斷，回應公眾訴求，於 2015-2016 年度
增加煙草稅 100%，以有效鼓勵吸煙人士戒煙，
及在 1 至 2 年內減低吸煙率至單位數字。

為將吸煙率下降至 5%或以下，並於 2022 年實現無煙香港，政府應制定積極及長遠的煙草稅政策，同時應增撥資源予控煙工作，包括教育宣傳、戒煙服務及打擊私煙等。

二零一五年二月三日

副本抄送： 香港特別行政區行政長官
食物及衛生局局長

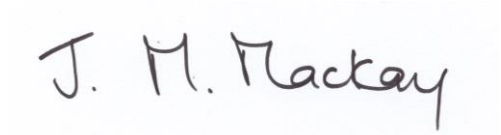
聯署團體：

鄺祖盛 MH
香港吸煙與健康委員會主席

劉文文 BBS MH JP 太平紳士
香港吸煙與健康委員會前主席 (2008 年至 2014 年)

左偉國醫生 SBS BBS 太平紳士
香港吸煙與健康委員會前主席 (2002 年至 2008 年)

ASIAN CONSULTANCY ON TOBACCO CONTROL
亞 洲 反 吸 煙 諮 詢 所



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世界肺健基金會資深顧問

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香港社會醫學學院
香港牙科醫學院
香港急症科醫學院
香港家庭醫學學院
香港婦產科學院
香港眼科醫學院
香港骨科醫學院
香港耳鼻喉科醫學院
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香港社區及公共健康護理學院	香港助產士學院
香港危重病護理學院	香港護理及衛生管理學院
香港護理教育及科研學院	香港骨科護理學院
香港急症科護理學院	香港兒科護理學院
香港老年學護理專科學院	香港圍手術護理學院
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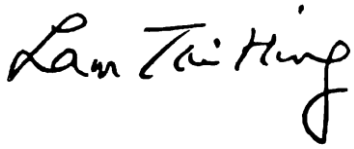

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新聞稿

吸煙引致香港經濟損失年逾 50 億港元
亞洲首次全面分析

香港大學醫學院公共衛生學院及社會醫學系於 2000 至 2004 年進行一項研究評估因煙草引致的疾病 (包括吸煙或二手煙所引致的疾病)，為香港所帶來的經濟損失。結果顯示，煙草引致的疾病為香港每年帶來逾 50 億港元的經濟損失。

研究背景

港大醫學院社會醫學系副教授麥潔儀博士乃該報告主要研究員。她表示，研究集中評估由吸煙和二手煙引致的死亡與疾病所帶來的經濟損失，包括額外醫療服務需求和因請病假或提早死亡對生產力造成的損失。

研究方法

研究隊伍利用廣泛的資料，包括一些本地的專門研究（主要是香港大學以往的研究）和其他常規的政府數據。這些資料包含主動和被動吸煙的致病風險、因個別疾病的住院日數、診所求診次數、病假和長期護理的數據等。

研究結果

生命損失

麥潔儀博士指出：

1. 香港在一九九八年大部份由煙草引致的經濟損失是來自 **6,920 宗因吸煙或二手煙所引致的死亡個案(年齡三十五歲及以上)**；
2. **當中有 3,927 宗(57%)屬於提早死亡(七十五歲之前)**；
3. **其中約有 19%（即 1,324）是因吸入二手煙導致。**

生產力損失

1. 吸煙者或被動吸煙者在有生產力期間(六十五歲之前)死亡的有 1,707 人，每年所損失的工作年數相等於 **14 億港元**。
2. 私人和公共機構員工因吸煙和二手煙致病而需請病假的損失，**每年高達 4 億 2 千萬港元**。

醫療服務開支

麥潔儀博士表示，與吸煙和二手煙有關的直接醫療服務開支包括：

1. 成人住院服務達 **19 億港元**；
2. 額外求診開支則達 **7 億 1 千萬港元**；
3. 在兒童方面，因吸入二手煙而需要接受醫療服務的開支是 **3 千萬港元；**
4. 因為煙草引致疾病而需入住護理中心和接受長期家居護理服務的人士，其支出**每年**達 **9 億 2 千萬港元**。

該報告估計，每年與吸煙和二手煙有關的直接醫療服務開支當中，包括：

1. 急性和長期醫療服務達 **26 億港元**；
2. 長期護理服務（主要是護理中心的服務）達 **9 億港元**；
3. 所損失的生產力則達 **18 億港元**。

約 82%的醫療服務開支是由公共醫療系統負擔。二手煙引致的健康問題約佔醫療服務總開支的 28%，亦佔所損失的生產力的 26%。

香港的經濟損失

麥潔儀博士說：「研究隊伍總結，香港因煙草引致的**總經濟損失達 53 億港元 (以 1998 年價格計算)。這些損失包括因吸煙和二手煙導致的醫療服務開支，院舍照顧服務開支及工作時間的損失。有關數據還未計算因吸煙和二手煙引致的 6,920 宗死亡個案（包括 3,927 宗提早死亡）所造成的生命價值損失。**公共和私人機構各承擔總經濟損失（53 億港元）的一半。」

麥潔儀博士強調，以上的數字並未包括一些未能用金錢計算的損失，例如疾病帶來的痛苦和折磨。

結論

澳洲昆仕蘭大學 Helen Lapsley 教授說：「識別出各種損失是監管煙草的重要步驟，而香港的研究結果是真確和合理的。澳洲已有廣泛的同樣研究，結果與香港相似。事實上，澳洲的吸煙率更高，而吸煙致病情況亦更常見。」**Lapsley 教授強調，澳洲與香港所估計的經濟損失，有力地指出社會需要更多資源推行有效的預防措施。根據澳洲的損失計算，香港每年最少需要 5 千萬港元於預防措施上。**

港大醫學院社會醫學系講座教授賀達理教授說：「煙草所帶來的龐大經濟損失已清楚顯示我們不能將煙草當作一般貨品。」年青人對尼古丁的依賴是煙草流行的根源，而從來沒有任何研究指出售賣煙草可為社會帶來得益。該研究與世界銀行的觀點完全相同，就是煙草只會給社會帶來淨損失。**賀達理教授說：「我們不能再容許延誤實行一些能減低消耗有限醫療資源的措施。」**

港大醫學院社會醫學系系主任及講座教授林大慶教授呼籲所有政府部門、立法會議員和醫療界人仕仔細參閱該項研究結果。他說這些資料為制定預防急性及長期疾病和醫療服務開支的政策，提供有力支持。林教授強調香港急需投資於專業的戒煙服務及實施無煙政策，以加速減低醫療服務開支。

研究隊伍鳴謝香港醫院管理局提供重要的數據及香港衛生署和 BUPA(亞洲)有限公司給予的資料。

是次研究獲香港特別行政區政府健康護理及促進基金撥款（編號：212919）資助。而香港大學生活方式與死亡研究是由香港醫療服務研究委員會（編號：631012）及香港吸煙與健康委員會撥款資助。

傳媒查詢，請聯絡香港大學醫學院楊傑遜小姐（Ms Janet Yeung），電話：2819-5505/9107-1676 或管啟妍小姐（Ms Candice Koon），電話：2819-9305/9408-3169。

新聞界如欲索取有關補充資料，請瀏覽網址 http://www.hku.hk/facmed/press/。

二零零五年二月二十四日

附件 B

世界卫生组织
烟草控制框架公约

世界卫生组织烟草控制框架公约
缔约方会议

第六届会议
俄罗斯联邦莫斯科，2014 年 10 月 13-18 日

FCTC/COP/6/DIV/4
2014 年 10 月 13 日

世界卫生组织总干事陈冯富珍博士致词

2014 年 10 月 13 日

感谢缔约方会议第六届会议主席 Chang-jin Moon 教授。还要感谢我的好姐妹 Veronika Skvortsova 部长。

尊敬的各位部长，尊贵的各位代表，公共卫生部门和联合国的朋友和同事们。我看到台下有许多老朋友。真高兴见到如此多的朋友。

女士们、先生们，早上好。

首先，请允许我感谢俄罗斯联邦作为东道国主办世界卫生组织烟草控制框架公约缔约方会议第六届会议。我本人必须要说，我目睹了普京总统领导的该国政府，当然还有你，Veronika 姐妹，如何致力于克服艰巨挑战，推动达成非常全面的烟草控制法。

该法于今年 6 月 1 日全面生效。我要感谢你们的领导作用。几年前有很多人告诉我，这在俄罗斯联邦绝无可能。感谢你们证实了他们的错误。

猜测是许多人无伤大雅的嗜好。一些人猜测我不会出席本届会议，因为我正在忙于应对其他多种传染病的爆发。

不，不，不。我不会缺席本届会议，因为它非常重要。

关于传染病问题，我需要讲几句话。

就在过去几天，多变的微生物世界几度尖锐地提醒人们注意它的威力。埃及确认了一例婴儿 H5N1 禽流感。奥地利报告了其第一例呼吸综合征冠状病毒病例。美国确认了其最初两例埃博拉病例。西班牙确认了其本土传入的第一例埃博拉病例。

女士们、先生们，

在一个充斥着如此众多新老威胁的世界上，我们现在转向烟草控制。烟草控制无疑蕴含了拯救千百万生命的最大也最切实的良机。我很高兴今天与大家一起，看到这次会议启动了一个很好的开端。

大家知道，我从不回避作为烟草业的头号敌人，信守世卫组织的立场。我将此作为一种荣耀。正是本着这种精神，世卫组织协助那些面对烟草业意料之中的强力对抗的国家，疾呼公共卫生，并展示同行审查证据的力量。

随着《框架公约》的实施达到新的高度，烟草业开始通过一切可能渠道猛烈反击，不管这些渠道或做法有多么的不正当。在国家法院起诉政府已屡见不鲜，尤其是针对其批准在烟草制品包装上印制大幅警示。

一个尤其令人不安的趋势是，烟草业利用双边投资条约，试图阻止政府通过已知的行之有效的烟草控制措施，保护其公民的健康。就乌拉圭的警示标签和品牌措施提起诉讼即是一个例子，澳大利亚采取无装饰包装的大胆和勇敢行动，也遭遇了类似情况。

澳大利亚取消烟草的装饰包装在世界贸易组织也成为一个争议问题。所有人都在关注此一案例。在世贸组织历史上，从来没有过如此众多的争端第三方参与进来。

最近，烟草业通过一次大吹大擂的举动，针对烟草控制的核心内容，表达了它的议程和声音。昨天，其董事会中有若干烟草公司成员的国际税务和投资中心约集缔约方和观察员来讨论烟草税和价格政策问题，但并未充分披露其既得利益。

请大家不要受它们的蒙蔽。

它们的议程，至少是很容易看穿的:削弱大家的能力，破坏大家的努力，以阻止就烟草税和价格政策通过坚定的和由专家主导的拟议准则。这些准则，一旦用于实施《公约》第 6 条，将保护儿童和青年人，尤其是保护他们避免开始使用烟草。

在现在已经进入公共领域的堆积如山的业内文件中记录了一次意见交流。让我告诉大家这样一份文件。它记录了一次讨论，一次内部讨论，涉及烟草业是否应当将儿童作为市场的一部分。我对一个答复记忆犹新，我来直接引用一下："他们长了嘴唇吧？我们需要他们。"

因此，女士们、先生们，这就是烟草业的策略。它们只贪图越来越多的市场份额。至于是否戕害儿童，它们漠不关心。

同样，请大家不要受它们的蒙蔽。

接下来的挑战是什么？接下来的挑战是，烟草业正在加强其对电子烟市场的支配力。这倒一点也不令人意外。一家烟草公司利用今年的世界无烟日，呼吁世卫组织，以及所有各国政府倡导电子烟，以此方式来保护一些生命，而它们正利用其出售的其他产品危及这些生命。

我们还听到类似的一种论调。一家公司坚称它"可以而且应当成为这场辩论的一部分，以及可能的解决办法。"

决不可能。如我以前说过的，让任何烟草公司在谈判桌上占有一席之地，无异于任命一群狐狸组成委员会来照料鸡雏。

女士们、先生们，

我们从多方来源获得的大量证据表明，实施《框架公约》带来了当下和长远的健康改善。2011 年，联合国大会——你们各国政府，发表了关于非传染性疾病的具有里程碑意义的决议，如我在当时所说的，请允许我引用："充分实施《世界卫生组织烟草控制框架公约》将是对所有这些疾病最具预防性的一击。"

时间已经证明，烟草公约之所以重要，还有第二个理由。它是政府多个部门、联合国多个机构在最值得珍惜的共同目标之下团结起来，毫无嫌隙地通力合作的范式。随着本世纪越来越多的对健康的最大威胁出于多种根源，而世界各国尽其最大努力充分实施该条约，以及《公约》各项条款，这一范式的重要性将与日俱增。

女士们、先生们，

我祝愿大家在莫斯科转向这一个沉重但极其重要的议程时，将成就一届硕果累累的会议。

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附件 C
TC Online First, published on January 6, 2015 as 10.1136/tobaccocontrol-2014-051937

OPEN ACCESS

Did the tobacco industry inflate estimates of illicit cigarette consumption in Asia? An empirical analysis

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ABSTRACT

Objective Estimates of illicit cigarette consumption are limited and the data obtained from studies funded by the tobacco industry have a tendency to inflate them. This study aimed to validate an industry-funded estimate of 35.9% for Hong Kong using a framework taken from an industry-funded report, but with more transparent data sources.

Methods Illicit cigarette consumption was estimated as the difference between total cigarette consumption and the sum of legal domestic sales and legal personal imports (duty-free consumption). Reliable data from government reports and scientifically valid routine sources were used to estimate the total cigarette consumption by Hong Kong smokers and legal domestic sales in Hong Kong. Consumption by visitors and legal duty-free consumption by Hong Kong passengers were estimated under three scenarios for the assumptions to examine the uncertainty around the estimate. A two-way sensitivity analysis was conducted using different levels of possible undeclared smoking and under-reporting of self-reported daily consumption.

Results Illicit cigarette consumption was estimated to be about 8.2–15.4% of the total cigarette consumption in Hong Kong in 2012 with a midpoint estimate of 11.9%, as compared with the industry-funded estimate of 35.9% of cigarette consumption. The industry-funded estimate was inflated by 133–337% of the probable true value. Only with significant levels of under-reporting of daily cigarette consumption and undeclared smoking could we approximate the value reported in the industry-funded study.

Conclusions The industry-funded estimate inflates the likely levels of illicit cigarette consumption.

INTRODUCTION

Article 6 of the WHO Framework Convention on Tobacco Control (FCTC) recommends the use of taxation and pricing policies on tobacco products to decrease tobacco use.[1] Increasing tax that results in an increase in cigarette prices is considered to be an effective policy to reduce tobacco consumption, induce smokers to quit and, in particular, reduce the initiation of smoking among young people[2] without reducing the revenue of the government.[3] The argument that illicit trade will increase as a result of price rise is often raised by tobacco companies, sometimes successfully, to oppose tobacco tax increases.[4] The tobacco companies themselves, on the other hand, are the major beneficiaries of illicit trade and have been found to facilitate smuggling so that cigarettes penetrate youth markets.[4]

Data on illicit cigarette consumption are limited and not available in many countries.[5] The available data, often provided by industry-funded studies, have an incentive to inflate the extent of illicit cigarette consumption to oppose tobacco tax increases. Joossens *et al*[6] showed that estimates from Project Star, which was commissioned by Philip Morris International (PMI) and compiled by Klynveld Peat Marwick Goerdeler (KPMG), were higher than the estimates based on a study among a sample of representative smokers in 11 of 18 European countries. Stoklosa and Ross[7] showed that the industry estimate in Poland (22.9%) was higher than their estimates based on survey data (14.6%) or based on representative-discarded pack data (15.6%). van Walbeek[8] compared the estimates presented by the Tobacco Institute of Southern Africa (30%), a body representing the interests of large cigarette companies, with estimates based on rigorous econometric methods (6.1%) and showed again that the industry-funded data were not reliable.

Another more recent example is the report, "Asia-Illicit Tobacco Indicator 2012".[9] This study was funded by PMI and compiled by Oxford Economics (OE) and the International Tax and Investment Center (ITIC). The ITIC itself is funded by major transnational tobacco companies. In the report, illicit cigarette consumption in 11 Asian markets was estimated and claims were made that in 2012, illicit consumption comprised 35.9% of total cigarette consumption in Hong Kong. This estimate lacked rigorous validation, and the methods by which it had been obtained were not clearly described. The Southeast Asia Tobacco Control Alliance raised many questions about the sources of data, analytic methods and conclusions of this report.[10] Nonetheless, the OE estimates for Hong Kong have been used to oppose tax increases.

In Hong Kong, stopping the illicit trade of tobacco, especially cigarette smuggling, has always been a priority of the Customs and Excise Department (CED). The drop in the number of seized cigarettes in the past decade, from 153 million sticks in 2003 to 39 million sticks in 2012, indicates that more stringent enforcement by the CED along with better cooperation with counterparts in bordering countries, primarily Mainland China and other local enforcement agencies, has deterred smuggling activities.[11] In the meantime, in February 2009 and February 2011, the Hong Kong Government increased tobacco tax by 50% and 41.5%, respectively. Tobacco tax revenue increased from HK$2.8 billion in 2007 to HK$5.0 billion in 2012,[11] while the prevalence of smoking declined from 11.8% in 2007 to 10.7% in 2012.[12 13] The number of seized cigarettes in 2009 (29 million sticks) and 2011 (57 million sticks) did not increase as compared to the previous years of 2008

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(81.6 million sticks) and 2010 (57 million sticks).[11] However, when tobacco control and public health professionals in Hong Kong pressed the government to increase tobacco tax by 100% in 2013 and when the Bill to increase tax on tobacco was introduced in the Legislative Council in 2014, the OE estimate of 35.9% of cigarette consumption being illicit, which had been presented to the mass media in Hong Kong in 2013, was repeatedly used by opponents of tobacco taxation to lobby the government not to increase tobacco tax. Finally, in 2014, the Hong Kong Government increased the tax by only 11.7%.

Therefore, the current study aimed to estimate illicit cigarette consumption in Hong Kong in 2012 and to validate the estimate published by OE. To do this, we used a comparable estimation framework, including consumption by Hong Kong residents and visitors, but our data came from more reliable and transparent sources.

METHODS

Estimation framework

Approach adopted by ITIC and OE

The report by ITIC and OE (OE Report) describes their estimation framework as:

Total cigarette consumption = legal domestic consumption
+ legal non-domestic consumption
+ illicit domestic consumption
+ illicit non-domestic consumption[9]

The OE Report used a bottom-up approach to estimate total cigarette consumption. The report estimated the legal domestic consumption from the legal domestic sales data from the Hong Kong CED minus the outflows of duty-paid cigarettes to other countries based on the 'empty pack surveys' (EPS) in other countries, legal non-domestic consumption from EPS plus 'OE estimates', and illicit non-domestic consumption based on EPS plus 'OE estimates' (Annexe A, Page 94).[9] The total consumption was then the sum total of the above three components and the EPS plus OE estimates (Annexe A, page 94).[9]

OE estimates for Hong Kong were mostly based on the EPS for which previous studies have raised serious concerns[7 10 14 15] and no details were disclosed anywhere as to how the survey had been carried out. There are many questions about this approach in the case of Hong Kong, the answers to which could greatly affect the results of the survey and interpretation of those data. For example: (1) How did they identify any empty pack that was duty-paid, smuggled or duty-free, since this information is usually not available on the pack in Hong Kong? (2) Could the sampled sites and timings yield a representative sample of all packs discarded in Hong Kong? (3) What was the final sample size with regard to the number of packs picked up from different bins and locations at different times? For example, how many packs were picked up on weekdays or weekends or holidays (such as 'Golden Week' holidays)? How replicable were the data? (4) How can we interpret these data in terms of consumers (local residents or visitors) who had smoked the cigarettes from the empty packs? The answers to these questions are the minimum information we would need to determine the validity and reliability of the survey methods used; and hence, the likely accuracy and representativeness of the results presented.

In our estimate, we used the same overall framework described above, but included only data from known sources and methods that are reproducible. We used a top-down approach where we first estimated the total cigarette consumption and then, legal domestic and non-domestic consumption. The difference between the total consumption and the legal domestic and non-domestic consumption were the illicit cigarette consumption. Our methods are described below.

Estimation of illicit cigarette consumption

Hong Kong, as an international metropolis, attracts tourists and business personnel from all over the world. In 2012, visitor-arrivals amounted to 48.6 million.[16] Using the same framework as in the OE Report, we summarised and labelled the different types and sources of cigarette consumption in Hong Kong (table 1).

We estimated illicit cigarette consumption by Hong Kong smokers and visiting smokers, using the following formulae:

$$\begin{aligned}&\text{Illicit consumption by Hong Kong smokers } (I_h)\\ &= \text{annual cigarette consumptionby Hong Kong smokers } (A_h)\\ &\quad - \text{annual legal consumption byHong Kong smokers } (B_h)\\ &\quad - \text{annual legal personal importsby Hong Kong smokers } (C_h)\end{aligned} \tag{1}$$

$$\begin{aligned}&\text{Illicit consumption by visitors } (I_v)\\ &= \text{total cigarette consumptionby smoking visitors } (A_v)\\ &\quad - \text{total legal consumption by visiting smokers } (B_v)\\ &\quad - \text{total legal personal imports by smoking visitors } (C_v)\end{aligned} \tag{2}$$

We calculated the total annual cigarette consumption (legal plus illicit) by summing the annual cigarette consumption by Hong Kong smokers (A_h) and by visiting smokers (A_v). The illicit consumption was estimated as this total minus the legal domestic consumption (B_h), legal personal imports (C_h), legal non-domestic consumption (B_v) and legal personal imports by visitors (C_v). The illicit consumption could be summarised thus:

$$I = I_h + I_v = (A_h + A_v) - (B_h + B_v) - (C_h + C_v). \tag{3}$$

Our data sources are detailed below.

Parameters and data sources

Annual cigarette consumption by Hong Kong smokers (A_h)

This was estimated from the Hong Kong Thematic Household Survey 2012 (THS No. 53).[13] THS is a population-based household survey conducted regularly by the Census and Statistics Department. THS No. 53 provided the smoking prevalence by age group and sex, and the average daily consumption of current smokers in each group in 2012. A_h was calculated by multiplying the average daily consumption of each smoker by age group and the number of smokers in each group, and then grossing up to a year (366 days in 2012). The estimated A_h was 3227 million sticks, which included legal and illicit

Table 1 Composition of cigarette consumption in Hong Kong, 2012

	Origins of smokers	
Type of consumption	Local smokers	Visiting smokers
Legal consumption	B_h	B_v
Legal personal imports	C_h	C_v
Illicit consumption	I_h	I_v
Total consumption	A_h	A_v

Table 2 Estimated number of smokers among visitors in Hong Kong, 2012

Country of residence	Number of overnight visitors[17]	Proportion of people aged 15+[23]	Smoking prevalence of those aged 15+	Number of visiting smokers
Mainland China	15 110 372			
Male (40.0%[24])	6 044 149	82.0%	52.9%[19]*	2 621 831
Female (60.0%[24])	9 066 223	82.0%	2.4%[19]*	178 423
Other places	8 659 823			
Male (44.0%[24])	3 810 322	73.6%	36.0%[18]†	1 009 583
Female (56.0%[24])	4 849 501	73.6%	8.0%[18]†	285 539
Total number of smokers among visitors				4 095 376

*Smoking prevalence in 2010.
†Prevalence of smoking any tobacco product among adults aged ≥15 years in 2009.

consumption. Consumption by occasional smokers (prevalence was 1% in 2012) was not counted in this calculation because the smoking intensity by occasional smokers had not been captured in THS No. 53 and their contribution to the estimated annual cigarette consumption was not likely to be significant.

Annual cigarette consumption by visiting smokers (A_v)

This was estimated from the product of the number of overnight visitors,[17] the smoking prevalence in the visitors' original countries,[18 19] the average length of stay in Hong Kong of overnight visitors[16] and the average daily consumption of visiting smokers.[20–22] Among the 48.6 million visitors in 2012, 23.7 million stayed overnight and the other 24.8 million were 1-day visitors.[17] The 1-day visitors were assumed to bring cigarettes within the duty-free allowance (19 sticks) for a day visit, given the fact that smokers usually carry cigarettes with them when they are going out. So consumption by 1-day visiting smokers was removed from this calculation. An estimated 4.1 million overnight visiting smokers arrived in Hong Kong in 2012 (table 2). We estimated A_v from these 4.1 million overnight visiting smokers under several scenarios, which have been described in Alternative Scenarios.

Annual legal consumption by Hong Kong smokers and visiting smokers (B_h+B_v)

This is equal to the annual legal domestic sales of cigarettes in Hong Kong estimated by dividing the total cigarette tax revenue by the tax rate per stick. In 2012, the tax revenue was HK$5024 million.[11] According to THS No. 53, 99.4% of current smokers consumed cigarettes and only 0.8% consumed other forms of tobacco.[13] We assumed that 99% (HK$4974 million) of the tobacco tax revenue was from cigarettes. Hong Kong had a single specific excise tax rate of HK$1706 for 1000 cigarettes (equivalent to HK$34 per pack of 20), so the annual legal domestic sales were 2925 million sticks (HK $4974 million×20 sticks/HK$34) in 2012. These legal duty-paid sales of cigarettes would be consumed by Hong Kong or visiting smokers (B_h+B_v).

Legal personal imports for Hong Kong smokers and visiting smokers (C_h+C_v)

These were estimated based on the number of incoming smokers to Hong Kong using data on the number of incoming passengers into Hong Kong and the smoking prevalence of Hong Kong residents aged 15 or above, and the number of incoming visitors, their countries of origin and smoking prevalence in their home countries for those aged 15 or above. Several assumptions were made regarding the total number of duty-free cigarettes brought by the incoming smokers and these are described below.

Alternative scenarios for estimating A_v and C_h+C_v

There is uncertainty around the average daily consumption of visiting smokers since passengers may temporarily change their smoking habits during a trip, and also around the amount of legal personal imports (duty-free consumption) by Hong Kong smokers and visiting smokers, since they may or may not bring cigarettes with them. Thus, three scenarios were examined to show how the different possible magnitudes of these parameters would influence illicit cigarette consumption estimates (I) (table 3).

Midpoint estimate

Among the overnight visitors, 15.1 million (63.6%) were from Mainland China and the rest were mainly from other Asian countries (22.1%), Europe (6.7%), the Americas (5.2%) and Australia (2.4%).[17] The average daily consumption reported by smokers in China was 17 sticks,[20] in the US 16 sticks,[21] in Australia 14 sticks and in the UK 12 sticks.[22] The mean (15 sticks) reported daily consumption was used in the calculation for this scenario, assuming that visitors would not change their smoking habits during a trip. During a typical 4-day visit (average length of stay of overnight visitors was 3.5 nights[16]) to Hong Kong, one visiting smoker would smoke 60 cigarettes.

The total cigarette consumption of smoking visitors (A_v) was estimated to be 245.7 million sticks (4.1 million visiting smokers×15 sticks per day×4 days). There were 133.9 million passengers who arrived in Hong Kong in 2012 including Hong

Table 3 Scenarios for the estimation of illicit cigarette consumption in Hong Kong

Scenarios	Average daily consumption by visiting smokers	Number of smokers (million) among Hong Kong passengers who bring duty-free cigarettes (%)	Number of visiting smokers (million) who bring duty-free cigarettes (%)
Upper bound	17	0 (0)	2.05 (50)
Midpoint bound	15	4.04 (50)	3.07 (75)
Lower bound	13	8.09 (100)	4.1 (100)

Kong passengers and visitors.[25] The total visitor arrivals was 48.6 million so there were 85.3 million (133.9–48.6) incoming Hong Kong passengers. Scaling by smoking prevalence (10.7% in those aged 15 or above) and the proportion of people aged 15 or above (88.6%[26]), there were 8.09 million Hong Kong smokers among the incoming passengers. In this scenario, 75% of visiting smokers and 50% of Hong Kong smokers, among the incoming passengers, were assumed to bring cigarettes with them when entering Hong Kong. Thus, the legal personal import (duty-free consumption) (C_h+C_v) was estimated to be 135.2 million sticks (50%×8.09 million incoming HK smokers×19 sticks per smoker+75%×4.1 million visiting smokers×19 sticks per smoker).

Upper bound estimate

The average daily consumption by Chinese smokers (which was the highest reported) was used in this scenario. A_v was estimated to be 278.5 million sticks (4.1 million visiting smokers×17 sticks per day×4 days). Conservatively, it was assumed that none of the smokers among the incoming Hong Kong passengers and 50% of all visiting smokers would bring duty-free cigarettes (19 sticks) when entering Hong Kong. Thus, in this scenario, C_h+C_v was 38.9 million sticks (4.1 million visiting smokers×50%×19 sticks per smoker).

Lower bound estimate

The average daily consumption by Hong Kong smokers (13 sticks[13]) was used in this scenario. Since Hong Kong has comprehensive smoking bans in almost all public places, it was assumed that visiting smokers during the trip in Hong Kong would reduce their daily consumption to the level of Hong Kong smokers. A_v was estimated to be 212.9 million sticks (4.1 million visiting smokers×13 sticks per day×4 days). It was assumed that all smokers among Hong Kong incoming passengers and all visiting smokers would bring cigarettes with them. C_h+C_v was estimated to be 231.5 million sticks (8.09 million incoming HK smokers×19+4.1 million visiting smokers×19).

Sensitivity analysis

The estimation of total cigarette consumption was based on self-reported smoking status and self-reported daily consumption by smokers. Some previous studies claimed that smokers may under-report their daily consumption.[27–29] We have no estimate of what this proportion might be in Hong Kong but we tested the impact on the results of under-reporting of consumption by 10%, 15% and 20%. It is also claimed that some smokers might not admit to smoking at all. However, Yeager and Krosnick carefully assessed the reasons for apparent differences between self-reported and biochemically-validated prevalence and concluded that there was little evidence of deliberate misreporting of smoking habits.[30] They were investigating face-to-face self-reports but commented that this result may apply also to other methods of data collection such as telephone surveys. Therefore, as a conservative approach, we have tested their maximum estimate of up to 0.94% of smokers denying that they smoked. We used a two-way sensitivity analysis, testing how levels of under-reporting of consumption, that is, 10%, 15% and 20%, and values of undeclared smoking prevalence, that is, 0.3%, 0.6% and 0.94%, would influence our estimates.

RESULTS

Illicit cigarette consumption was estimated to be 411.8 million sticks in 2012 in Hong Kong, ranging from 282.7 to 540.8 million sticks (table 4). The estimated illicit cigarette consumption as a percentage of total consumption ranged from 8.2% to 15.4% with a midpoint estimate of 11.9%. This implies that the tobacco-industry-funded OE Report estimate of 35.9% inflated the illicit cigarette consumption in 2012 in Hong Kong, relative to our estimate, by 133% to 377% (35.9/15.4-1, 35.9/8.2-1). Sensitivity analysis showed that only with 20% under-reporting of daily consumption and 0.94% undeclared smoking prevalence (for which we would have to underestimate consumption by 976.2 million cigarettes per year), could our estimate approach that from the industry-funded report.

DISCUSSION

Our study, using a framework comparable to the one used in a recent industry-funded report but based on data in the public domain from verifiable sources, showed that illicit consumption in 2012 in Hong Kong ranged from 8.2% to 15.4% with a midpoint estimate of 11.9%. The estimate in the OE Report (35.9%), funded by Philip Morris, inflated the illicit cigarette consumption estimate by 203% (range 133–337%). Only if there had been a significant under-reporting of daily cigarette consumption and undeclared smoking prevalence, could our estimate approach the values reported in the industry-funded study.

Research on the global illicit cigarette trade has estimated that illicit cigarettes account for 11.6% of the total market: 16.8% in low-income and 9.8% in high-income countries.[5] Our estimate for Hong Kong (midpoint 11.9%) is comparable to this global estimate. Our findings are consistent with a growing body of other overseas academic studies, which report that industry-funded studies tend to exaggerate illicit consumption. Such exaggeration has been found in tobacco industry backed reports on the West European,[6] East European[7] and African markets[8] and now Asian markets as well. A recent empirical analysis in Vietnam used two methods: the difference between legal sales and domestic tobacco consumption from surveys, and the trade difference between Vietnam and trade partners; both were based on publicly available data and showed that illicit consumption in Vietnam ranged from 0.7% to 6%.[31] This was much lower than the estimate for Vietnam (19.4%[9]) in the same OE Report that we have described in this paper. The similarly-generated estimates for the other markets covered in the OE Report may also be substantially inflated. Scientific studies for other markets are needed to refute the dubious industry-funded estimates.

The tobacco industry has also manipulated the historical data to create an impression that illicit trade has been increasing dramatically. Blecher *et al*[32] identified inconsistencies between estimates of illicit trade for the same years released in successive editions of the Euromonitor reports for countries such as South Africa, Mexico and Bulgaria. Rowell *et al*[15], after closely examining the media coverage of illicit trade in the UK, showed that the claim of the tobacco industry on the rapidly increased illicit trade in the UK was inconsistent with historical trends and the industry data on illicit trade were unreliable.

Apart from exaggerating levels of illicit trade and manipulating the historical data to lobby against tobacco tax increases, the tobacco industry has been complicit in smuggling all over the world, a practice that has been exposed and sometimes brought to trial.[33] For example, in July 2008, in Canada, two tobacco companies pleaded guilty and admitted to having aided people to sell or keep tobacco products manufactured in Canada, but not packaged or stamped in conformity with the Excise Act, between 1989 and 1994.[34] In Vietnam, even after British American Tobacco (BAT) signed a licensing agreement with Vinataba, the

Table 4 Estimated illicit cigarette consumption (million sticks) in Hong Kong, 2012

	Upper	Midpoint	Lower
Total cigarette consumption	3505.5	3472.7	3439.9
Total legal consumption (sales)	2925.7	2925.7	2925.7
Total legal duty-free consumption	38.9	135.2	231.5
Estimated number of illicit cigarettes	540.8	411.8	282.7
Estimated illicit cigarettes as % of total consumption (%)	15.4	11.9	8.2
Inflation by tobacco industry-funded report (%)	132.7	202.8	336.9
0% undeclared smoker			
Illicit consumption as % of total consumption (10% under-reporting, %)	22.6	19.4	16.1
Illicit consumption as % of total consumption (15% under-reporting, %)	25.7	22.6	19.5
Illicit consumption as % of total consumption (20% under-reporting, %)	28.6	25.7	22.7
0.3% undeclared smoker			
Illicit consumption as % of total consumption (0% under-reporting, %)	17.5	14.0	10.4
Illicit consumption as % of total consumption (10% under-reporting, %)	24.5	21.3	18.1
Illicit consumption as % of total consumption (15% under-reporting, %)	27.5	24.5	21.5
Illicit consumption as % of total consumption (20% under-reporting, %)	30.3	27.5	24.6
0.6% undeclared smoker			
Illicit consumption as % of total consumption (0% under-reporting, %)	19.5	16.0	12.4
Illicit consumption as % of total consumption (10% under-reporting, %)	26.3	23.2	20.0
Illicit consumption as % of total consumption (15% under-reporting, %)	29.3	26.3	23.3
Illicit consumption as % of total consumption (20% under-reporting, %)	32.0	29.2	26.3
0.94% undeclared smoker			
Illicit consumption as % of total consumption (0% under-reporting, %)	21.6	18.2	14.7
Illicit consumption as % of total consumption (10% under-reporting, %)	28.2	25.2	22.0
Illicit consumption as % of total consumption (15% under-reporting, %)	31.2	28.2	25.2
Illicit consumption as % of total consumption (20% under-reporting, %)	33.8	31.0	28.2

Upper: visiting smokers will smoke 17 cigarettes a day during a typical 4-day stay in Hong Kong. Fifty per cent of visiting smokers and none of smokers among Hong Kong passengers will bring as many duty-free cigarettes as allowed (19 sticks).
Midpoint: visiting smokers will smoke 15 cigarettes a day during a typical 4-day stay in Hong Kong. Seventy-five per cent of visiting smokers and 50% of smokers among Hong Kong passengers will bring as many duty-free cigarettes as allowed (19 sticks).
Lower: visiting smokers will smoke 13 cigarettes a day during a typical 4-day stay in Hong Kong. All visiting smokers and all smokers among Hong Kong passengers will bring as many duty-free cigarettes as allowed (19 sticks).

state tobacco monopoly, to produce and sell its State Express (SE) 555 cigarettes locally, BAT continued to supply traders smuggling UK made SE 555 into the country, apparently well aware of the illicit trade.[35]

The available evidence shows that illicit trade in the form of smuggling between jurisdictions with different levels of tobacco duty is linked, not primarily to the levels of tax but to the extent of corruption and criminality in individual jurisdictions.[36] The solution to this would be to deal firmly with the illegal activities, corruption and criminality associated with them, and to raise tobacco tax to provide more revenue for disciplined services to combat illicit trade.

Our estimate was validated using survey data in Hong Kong. In a recent population-based telephone survey in Hong Kong, among all randomly sampled current smokers (n=800) aged 15–65, 8.8% claimed that they had often bought cigarettes far cheaper than the regular prices in the past 6 months.[37] Of those who had bought the low-cost cigarettes, 28.5% believed that the cigarettes had been smuggled from other places. The survey did not record the number of illicit cigarettes consumed. The daily consumption of smokers who often bought low-cost cigarettes was 16.3 sticks as compared to 14.1 of the average daily consumption from the above survey. If the smokers who often bought low-cost cigarettes only smoked low-cost cigarettes and if all of the low-cost cigarettes had been smuggled, then the proportion of illicit consumption from this survey would be 10.2% (8.8%×16.3/14.1), which is within the range of our current estimates of 8.2–15.4%.

Our estimate was based on different assumptions but we always used the more conservative ones. We assumed the visiting smokers smoked the same amount of cigarettes as they did in their home countries (average daily consumption of 13, 15 and 17 in lower, midpoint and upper bound estimates, respectively). Hong Kong has a very comprehensive smoke-free law where almost all public places are smoke-free. Visitors during a trip may involuntarily reduce their cigarette consumption. One study in Thailand showed that the average daily consumption of a visiting smoker was 7.8.[38] If we applied this value, the illicit consumption as the percentage of total consumption would be 5.9–11.6%. We assumed at least 50% of visiting smokers would bring cigarettes with them when entering Hong Kong. Almost 70% of the visiting smokers were from Mainland China in 2012. Smokers from Mainland China predominantly smoke China-made cigarettes of Chinese brands, which are quite different from those smoked by Hong Kong smokers. There are over 200 domestic cigarette brands in the Chinese market.[39] It seems unlikely that most of these smokers would purchase cigarettes in Hong Kong, not only because prices are much more expensive[40] but primarily because Chinese smokers are not used to the taste of foreign brands of cigarettes such as Marlboro and Mild Seven, which are widely sold in Hong Kong.

There are smokers who do not admit their smoking status (undeclared smokers) and under-report their cigarette consumptions for whatever reasons. One study in the UK used an uplift factor correcting for this bias to estimate the illicit market for tobacco.[41] It calculated the uplift factor in a year in which the

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illicit market was estimated by other sources and believed to be small by comparing total consumption based on self-reported data with total consumption based on actual clearance and estimate of legal cigarettes brought from abroad. We are unable to do the same because such data were not available, but overseas studies showed that self-reports of smoking were accurate with minimal response bias, especially in nationally representative surveys in adult populations.[30 42 43]

This study is subject to several limitations that should be addressed in future work. The study provides a point estimate of illicit cigarette consumption in 2012 with a plausible range but cannot demonstrate that tax increases will not increase illicit cigarette consumption. For this, along with longitudinal survey data that can validly and directly monitor the changes of illicit consumption over time, we also need multiple methods to cross-validate different estimates, which should be considered in future work. Different methods of assessment may provide different estimates of illicit consumption.[44] The method used in our estimate (difference between total consumption and legal consumption) was a gap method that was used in studies in South Africa,[8] Vietnam[31] and the UK.[41] We cannot be certain whether our report overestimates or underestimates the true magnitude of illicit consumption. However, we have cross-validated our estimates using a different method and an entirely different data source. We also sought to use conservative assumptions as explained above in order to avoid underestimation. Our study provides a replicable model for estimating illicit cigarette consumption using scientifically valid data sources along with transparent and testable assumptions.

All the industry effort is to lobby decision-makers not to increase tax, undermine the effects of tobacco control policies and to eventually significantly benefit from it. The industry-funded estimate of 35.9% of consumption in Hong Kong being illicit, for example, was repeatedly used by opponents to argue against a tobacco tax increase in 2014 and the HK Government, instead of increasing the tax 100% as advocated by tobacco control professionals, finally only increased it 11.7%. By the time this paper was under revision, the ITIC and OE had already held two press conferences in Hong Kong to report their estimates of illicit cigarettes, which drew substantial attention from the public. Given the need for reliable data in order to inform local policies and to counter false arguments against the essential public health need to raise tobacco taxes, territories such as Hong Kong and the neighbouring regions need regular monitoring and continuous data collection on illicit consumption. Hong Kong should also ensure active co-operation from all its neighbours to reduce illicit trade while maintaining and increasing tobacco tax.

What this paper adds

- This is the first study to directly validate an industry-funded estimate of illicit cigarette consumption, using a comparable estimation framework employed by the industry but with reliable and transparent data sources.
- This estimate is based on the tobacco usage of residents and visitors who are smokers, to include all possible sources of illicit trade.
- Compared with our estimate, the industry-funded estimate of illicit cigarette consumption for Hong Kong had been inflated by at least 133%.

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Did the tobacco industry inflate estimates of illicit cigarette consumption in Asia? An empirical analysis

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