Did the Framework Convention on Tobacco Control reduce global cigarette consumption?

Framework Convention Alliance

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Cigarette consumption estimates for 71 countries from 1970 to 2015: systematic collection of comparable data to facilitate quasi-experimental evaluations of national and global tobacco control interventions

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ABSTRACT

OBJECTIVES

to collect, assemble, select, and report the best available national estimates of cigarette consumption since 1970.

RESULT

Cigarette consumption fell in most countries over the past three decades but trends by country specific consumption were highly variable. For example, China consumed 2.5 million metric tonnes (MT) of cigarettes in 2013, more than Russia (1.30 MT), the United States (0.28 MT), Indonesia (0.13 MT), Japan (0.12 MT), and the next 14 countries. The US and Japan achieved reductions of more than 0.1 MT from a decade earlier whereas, Russian consumption plateaued and Chinese and Indonesian consumption increased by 0.15 and 0.10 MT respectively. These data generally concord with modelled country-level data from the Garnier for national estimates of consumption and that is based on the additional advantage of not smoothing pre-year over-year diurnal inferences that are useful for robust quasy-experimental impact evaluations.

WHAT IS ALREADY KNOWN ON THIS TOPIC

The WHO Framework Convention on Tobacco Control (FCTC) has been negotiated to provide a public health approach to the implementation of tobacco control policies. This study found, combined with regional differences, should outline long-term changes in the global tobacco control community, narrative the potential of this study for policy development, provide a platform for tobacco control, and improve the rate of tobacco use and smoking cessation. The FCTC aims to reduce harmful tobacco consumption, lower smoking rates among children, and counteract the tobacco industry’s marketing, advertising, and promotion activities. To date, few studies have used a more rigorous quasi-experimental approach to evaluate the global impact of the FCTC. The aim of this study was to assess the extent to which cigarette consumption had already been falling for at least 10 years since the implementation of the FCTC in 2003.

WHAT THIS STUDY ADDS

This study adds to the body of evidence on the impact of the FCTC on global cigarette consumption. This study used a rigorous quasi-experimental approach to evaluate the global impact of the FCTC on cigarette consumption. The FCTC was implemented in 2003 and is the first global treaty to address the tobacco industry’s marketing, advertising, and promotion activities. To date, few studies have used a more rigorous quasi-experimental approach to evaluate the global impact of the FCTC. The aim of this study was to assess the extent to which cigarette consumption had already been falling for at least 10 years since the implementation of the FCTC in 2003.

Introduction

Tobacco consumption is one of the world’s leading causes of preventable deaths worldwide. Each year, tobacco is responsible for about 7 million deaths and, for nearly 300 million adults (1.1 billion or 4% of the economic damage owing to smoking healthcare system costs and lost productivity) is cause of premature deaths globally and|locates substantial societal burden on smokers and non-smokers alike. Yet, the global tobacco epidemic shows no signs of slowing. The World Health Organization predicts that the number of tobacco related deaths will increase to one billion by the year 2020. This study assessed the impact of the FCTC on global cigarette consumption and smoking prevalence in countries with and without implementation of tobacco control policies. The Framed Work on Tobacco Control (FCTC) was adopted under
Outline

Cigarette consumption data
Quasi-experimental analysis
Study Implications
Questions and discussion
Why the FCTC?

Clear and quantifiable outcome measure
One of few international laws governing health
No quasi-experimental study on global outcomes
Verified data from 71 countries

Open-access data available at: dataverse.scholarsportal.info/dataverse/ICCD
Why this data is needed

Open-access data available at: dataverse.scholarsportal.info/dataverse/ICCD
Quasi-experimental analysis
Logic model
Theoretical Effects

Socialisation effects
• Negotiating process (1999-2003)

Normative effects
• Treaty adoption (2003)

Legal effects
• Formally ratification (2005-present)
Tobacco control laws work when implemented

Table 1 | WHO’s MPOWER policy package and representative studies that have shown the effectiveness of each tobacco control policy at the national level[14-16-21]

<table>
<thead>
<tr>
<th>MPOWER policy and description</th>
<th>Studies evaluating at national level (first author and year)</th>
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<tbody>
<tr>
<td><strong>Monitor tobacco use</strong></td>
<td></td>
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<tr>
<td>Obtain nationally representative and population based periodic data on key indicators of tobacco use for youth and adults</td>
<td>Chung-Hall (2018); Katanoda (2014); Singh (2012)</td>
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<tr>
<td><strong>Protect people from tobacco smoke</strong></td>
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<tr>
<td>Enact and enforce smoke free environments in healthcare and educational facilities as well as in all indoor public places including workplaces, restaurants and bars</td>
<td>Chung-Hall (2018); Gravely (2017); Katanoda (2014); Lunze (2012); Lv (2011); Martínez (2013); Sebrîê (2012); Singh (2012); Thrasher (2008); Ujang (2015)</td>
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<tr>
<td><strong>Offer help to quit tobacco use</strong></td>
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<tr>
<td>Strengthen health systems so they can make tobacco cessation advice available as part of primary healthcare. Support quit lines and other community initiatives in conjunction with easily accessible, low cost pharmacological treatment where appropriate</td>
<td>Chung-Hall (2018); Gravely (2017); Katanoda (2014); Lunze (2012); Singh (2012)</td>
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<tr>
<td><strong>Warn about the dangers of tobacco</strong></td>
<td></td>
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<tr>
<td>Require effective package warning labels</td>
<td>Chung-Hall (2018); Gravely (2017); Katanoda (2014); Lv (2011); Mir (2013); Singh (2012); Hiliamo (2015)</td>
</tr>
<tr>
<td>Implement counter-tobacco advertising</td>
<td>Chung-Hall et al. (2018); Hiliamo and Glantz (2017)</td>
</tr>
<tr>
<td>Obtain free media coverage of anti-tobacco activities</td>
<td>Chung-Hall (2018)</td>
</tr>
<tr>
<td><strong>Enforce bans on tobacco advertising, promotion, and sponsorship</strong></td>
<td></td>
</tr>
<tr>
<td>Enact and enforce effective legislation that comprehensively bans any form of direct tobacco advertising, promotion, and sponsorship</td>
<td>Gravely (2017); Katanoda (2014); Lv (2011); Singh (2012)</td>
</tr>
<tr>
<td>Enact and enforce effective legislation to ban indirect tobacco advertising, promotion, and sponsorship</td>
<td>Gravely (2017); Katanoda (2014); Singh (2012)</td>
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<tr>
<td><strong>Raise taxes on tobacco products</strong></td>
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<tr>
<td>Increase tax rates for tobacco products and ensure that they are adjusted periodically to keep pace with inflation and rise faster than consumer purchasing power</td>
<td>Chaloupka (2012); Chung-Hall (2018); Gravely (2017); Katanoda (2014); Lunze (2012); Singh (2012)</td>
</tr>
<tr>
<td>Strengthen tax administration to reduce the illicit trade in tobacco products</td>
<td>Chaloupka (2012); Chung-Hall (2018)</td>
</tr>
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</table>
What does global consumption look like?
Gro Harlem Brundtland is elected as WHO Director-General, signalling the emergence of tobacco control as a global priority; the WHO Tobacco Free Initiative is created.

Call for treaty

43 countries ratify

27 countries ratify

Four countries ratify

One country ratifies

Three countries ratify

10 countries ratify

Six countries ratify

Two countries ratify

Adoption of the Protocol to Eliminate Illicit Trade in Tobacco Products; 12 November 2012; two countries ratify

FCTC treaty comes into legal force; 27 February 2005; 67 countries ratify

FCTC treaty adopted; 28 May 2003; five countries ratify

INB sessions 4 and 5 held

INB sessions 2 and 3 held

First meeting of the Intergovernmental Negotiating Body (INB); 16-21 October 2000

Informal negotiations begin; first meeting of the technical working group; 25-29 October 1999

The World Health Assembly, in resolution WHA49.17, requests the WHO Director-General to initiate preparation of a framework convention on tobacco control

First WHO “World Tobacco Day”
Interrupted Time Series Analysis

Null hypothesis: the FCTC has not accelerated a pre-existing decline in global cigarette consumption

Looking for a change in either level or slope of tobacco consumption after 2003

Data are non-stationary, so first-differencing was used to analyze year-over-year changes
Interrupted Time Series Analysis

- No significant global change in level or slope
- Significant decrease in Europe
- Significant increase in Upper middle income countries, low and middle income countries, Oceania, the Americas, Asia, and China
Robustness checks

Global findings are robust to:

- Socialization effects: Using 1999 as the intervention point instead of 2003
- Normative effects: Aligning data by year FCTC signed by each country
- Legal effects: Aligning data by year FCTC ratified in each country
- Composition effects: Removal of China and countries that have divided since 1970 from the sample
In-Sample Forecast Event Model

Models consumption with country- and year-specific data:

**Economy** - log of GDP in current USD, annual GDP growth, log of GDP per capita at PPP, international trade as percentage of GDP

**Political system** – V-Dem electoral democracy, liberal democracy, participatory democracy, deliberative democracy, and egalitarian democracy indices

**Human development** - UNESCO gender parity index, mean education of adults 25 and over for males and females, and education for women aged 15-44

**Other** – year and primary tobacco company
The gap between predicted and actual consumption increased from five cigarettes per adult per year in 2003 to 150 cigarettes per adult per year in 2008.
Country-Income Stratification

Graphs showing cigarette consumption per capita in HICs and LMICs over time, with actual and prediction lines, and 80%, 90%, and 95% intervals.
Regional Stratification: Americas

The graph illustrates the change in cigarette consumption per capita in the Americas from 1970 to 2010. The data includes actual consumption (dashed line) and a prediction (solid line) along with confidence intervals of 80%, 90%, and 95%. The graph indicates a decline in consumption, with a notable reduction post-2000, likely due to the implementation of the Framework Convention on Tobacco Control (FCTC).
Regional Stratification: Europe
Regional Stratification: Asia

![Graph showing cigarette consumption per capita in Asia over time with actual and predicted data, along with 80%, 90%, and 95% intervals.](image-url)
Robustness checks

Findings are robust to:

• Time effects: Using a one and two year distributed lag model
• Composition effects: removing China from the dataset
• Population effects: removing population weighting
• Model effects: Using alternate models with regional and subregional dummy variables; using simple predictive models
**Strengths**

Most complete, verified, non-modeled tobacco consumption dataset yet compiled

Triangularization through use of two complementary quasi-experimental designs

Dozens of robustness checks performed in comprehensive effort to uncover any global and stratified FCTC effects

**Limitations**

Cannot establish causality with quasi-experimental designs

Data is missing for many countries, although less than 5% of global consumption

We only investigated cigarette consumption

More time may be needed for treaty to have effects

ITS assumes a constant underlying time trend in the absence of an intervention

Event model assumes a constant association between cigarette consumption and the model’s explanatory variables before and after the intervention
Implications
Efficacy vs. effectiveness

Implementation capacity
- LMICs may not be able to implement tobacco control as quickly or effectively as high-income countries

Treaty Mechanisms
- Absence of enforcement mechanisms motivating implementation

Globalization and contraband
- Trade liberalization allowed more efficient tobacco trade and means of evading tobacco controls
HICs vs. LMICs

European Union accession
  • Countries implemented tobacco control due to EU requirements for new member countries

Increasing affordability in LMICs
  • Incomes are rising faster than tobacco prices in many countries
Synthesis of contradictions

“Varied implementation of tobacco control policies and shifting trends in cigarette affordability across countries may have generated market equilibrium effects incentivising the tobacco industry to move its lobbying, marketing, and promotion activities away from high income countries (where they faced increasingly stringent regulations) and towards low and middle income countries and Asian countries (with far less stringent measures).”
We must:

1. Rapidly scale the implementation of key tobacco control policies in low and middle income and Asian countries; and
2. More assertively counteract the transnational activities of the tobacco industry.
Tobacco Control: new resources, existing treaties & emerging challenges

Reflections on two new Hoffman et al studies in the BMJ – based on an accompanying editorial

Linda Bauld
Bruce & John Usher Chair in Public Health, Usher Institute, University of Edinburgh, UK
Outline

- Importance of the ICCD
- Other sources of data and complementarity
- Evaluation of the FCTC – understanding the context
- Remaining challenges
International Cigarette Consumption Database

• Hugely valuable new resource for researchers
• Exhaustive exercise to collect, review and report the data from a 45 year period
• Will provide a resource for future evaluations of national, regional & global tobacco control policies
• Identifies important differences from the results of previous modelling of country level data (i.e. IHME)
Complements other datasets

- International prevalence surveys like GYTS and GATS
- National prevalence surveys – essential for target setting, monitoring changes within countries – but these have gaps – particularly in Africa
- International Tobacco Control Policy Evaluation Project in 29 countries https://itcproject.org
We also need data on other tobacco products

• Smoked tobacco (cigarettes, cigars, cigarillos, pipes, bidis and other forms) is the most common form of tobacco use globally

• In most countries cigarettes dominate the market

• However, globally over 300 million people consume a diverse range of smokeless tobacco products

• With the exception of snus (low nitrosamine oral tobacco used in Scandinavia) these products are also highly harmful to health
FCTC Context: The Tobacco Epidemic

Adapted from Lopez et al. A descriptive model of the cigarette epidemic in developed countries. Tobacco Control 1994, 3 242-2474
SMOKING RATES DECLINE WITH ACTION

1952
CR-UK part-funded British Doctors Study is first to demonstrate smoking link to lung cancer

1965
Advertising of tobacco on TV ends in the UK

1980s
Tax rises for tobacco products

2000s
Media campaigns and services to help people quit

2002
Larger health warnings

2003
Billboard and print ads prohibited

2007
Smokefree policies introduced across the UK

2012
Point of sale displays removed in large shops

2015
Small displays removed

2015
Ban on smoking in cars with children, England & Wales

2016
EU Tobacco Products Directive (TPD) implemented

2017
All packs standardised and new tax measures

SMOKING RATES DON'T COME DOWN ON THEIR OWN
During the 1990s, there were periods when smoking rates stopped declining

Source: Adult Smoking Habits in Great Britain, Opinions and Lifestyle Survey, ONS
LET'S BEAT CANCER SOONER.
cruk.org
Highly variable implementation

FCTC implementation can reduce smoking

- Other studies have examined FCTC implementation
- Full (highest level) implementation of key FCTC Articles (i.e. 6, 8, 11, 13, 14) reduces prevalence, and the more Articles are implemented the greater the rate of decline
- Taking these and the Hoffman and colleagues findings into account means full implementation should be a priority for all Parties to the Treaty.

Have you adopted and implemented programmes on protecting public health policies with respect to tobacco control from...the tobacco industry? (by income group)

Source: Collin, J et al. Regulating tobacco industry interference and implementation of the WHO FCTC: Article 5.3 and the future of global health. The Endgame for Tobacco Conference, 10-12 Sept 2013, New Delhi, India

Data from FCTC implementation reports.
Conclusion

• The Global Strategy Lab (& colleagues) team should be commended for their new research and for the ICCD, particularly that this new dataset can be used by other researchers
• Their valuable analysis suggests that the full potential of the FCTC has not been reached
• There is an urgent need for continued investment in international tobacco control to increase capacity, improve governance, and enhance cooperation across countries to combat tobacco industry influence.
Thank You

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