Waterloo Smarter Health Seminar Series:



WATERLOO INSTITUTE FOR HEALTH INFORMATICS RESEARCH 'why not'

Why Not Evidence-based Health Policies for Nations?

The Case for Global Tobacco Control.

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> University of Waterloo May 23, 2007



Why Not Evidence-Based Health Policies for Nations? The Case for Global Tobacco Control

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Why Not? Smarter Health Seminar University of Waterloo May 23, 2007



Basic Questions in Global Health

- What are the major threats to global health?
- For each threat: what can we do about it?
 - What evidence is available to evaluate possible strategies for dealing with the threat?
- How do we identify and promote evidence-based policies for global health?
 - 1. System for surveillance of relevant health behaviours and for rigorous evaluation of ongoing interventions
 - 2. System linked to policymakers/governments invested in its outputs with clear path to action.





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Technology & Science	The globa	al epidemic		
Money	Last Updated Nov. 30, 2006			
Consumer Life	CBC News			
Sports	000110113			
Diversions	There have been a lot of developments since			
Weather	AIDS first appeared on the medical radar			
SERVICES »	screens in 1981. Back then, the diagnosis was a			
Membership Sign-up	death sentence.			
Breaking News Alerts				
E-mail Newsletters	But a November 2006 study in the New England Journal of Medicine provides more evidence that			
Video				
Podcasts	life-long antiretroviral therapy has turned			
Mobile/PDA	HIV/AIDS into a chronic disease rather than a countdown to death.			
RSS Feeds				





Economist.com

Bird flu in Asia

Bird flu flares up again in Asia

Jan 25th 2007 From The Economist print edition

THE deadly H5N1 strain of bird flu, which kills people as well as poultry, has broken out across a broad sweep of eastern Asia this month, from South Korea down to Indonesia (see map). Since the disease re-emerged four years ago, Asia's governments, backed by a plethora of United Nations agencies, have tried hard to stamp it out. But on January 22nd the boss of the World Health Organisation (WHO), Margaret Chan, said it would still take years to bring it under control....







WHEN DAYS TURN TO WEEKS...

Austhor of DPARS, Construction of DPARS, Cons

THE PROPHETIC NOVEL OF BIO-TERROR. THE STRAIN THAT STARTED IT ALL...

voyage au bout de l'horreur



Un film de Vincent DAWN avec Margi Evelyn NEWTON - Frank GARFEELD Selan KARAY - Robert O'NEIL

What About Chronic Diseases?

- Cardiovascular disease
 Stroke
 Diabetes
 Cancer
 - Chronic respiratory disease





Preventing CHRONIC DISEASES a vital investment



World Health Organization



PUBLIC HEALTH AGENCY of CANADA AGENCE DE SANTÉ PUBLIQUE du CANADA









Projected main causes of death by World Bank income group, all ages, 2005



Communicable diseases, maternal and perinatal conditions, and nutritional deficiencies Chronic diseases

Injuries

Projected chronic disease death rates

for selected countries, aged 30–69 years, 2005







Projected main causes of burden of disease (DALYs) by World Bank income group, all ages, 2005



Summary of Chronic Diseases

- NOT just a malady of the rich, fat, and happy
- 80% of chronic disease death occurs in low and middle income countries
- Chronic disease affects men and women equally
- Large proportion of chronic disease cases is due to (or whose course is governed by) <u>modifiable</u> <u>behaviours</u>

80% of chronic disease incidence or outcome is governed by modifiable behaviour



Tobacco as a Global Problem

"Tobacco is the most effective agent of death ever developed and deployed on a worldwide scale."

– John Seffrin, President, ACS and UICC (2002)



Smoking Prevalence in Canada





The Really Big Picture



International Tobacco Control Policy Evaluation Project





























Four Stages of the Tobacco Epidemic



Some Statistics on Global Tobacco Use

- 1.1 billion people smoke
 - 82% live in low-and middle-income countries
 - 500 million will die of tobacco-related causes
- 20th Century: 100 million tobacco-related deaths
- 21st Century: 1 billion tobacco-related deaths
- 5 million will die this year
- By 2020: 10 million will die/year
- WHO: Leading preventable cause of death and disability in the world



Increase in Smoking-Attributable Deaths 1990 to 2020



ritco

Murray and Lopez (1997): Global Burden of Disease Study

About Tobacco Use (Smoking)

- Smoking accounts for a high proportion of chronic disease incidence and severity
- Interacts with infectious diseases
 Implicated in tuberculosis: about half of TB cases among men in India due to smoking
- Research on smoking: very advanced
- Research on population approaches (policies): much less-developed (but far more developed than other health domains)
- Tobacco: leading edge for approaches to chronic disease prevention
 - Clinical approaches
 - Population approaches, including policies





RGI-CGHR Million Death Study: Preliminary results of male mortality in India at ages 25-69 yrs, 2001-3

	Smoking/ total deaths	RR (95% CI), smoker/ not	% attrib. smoking
Tuberculosis	<mark>311</mark> /755	2.7 (2.3-3.2)	41%
COPD	156/324	3.5 (2.5-4.9)	48%
Heart attack	<mark>293</mark> /1158	2.0 (1.7-2.4)	25%
Stroke	154/502	2.1 (1.7-2.4)	27%
Cancer	188/504	2.7 (2.1-3.5)	37%
All causes	1877/6278	2.2 (1.9-2.5)	30%

Source: Jha et al, forthcoming





If we can create effective methods for reducing the (global) tobacco epidemic, this will provide strong guidance for how to reduce other threats to global health



The Global View of the Tobacco Industry

"Tobacco use in the developed nations will trend down slightly through the end of the century, while in the developing countries use could rise by about 3% annually. A bright picture indeed! Not a smoke-free society, but continued growth for the tobacco industry."

– Document from 1989



Tobacco Industry and China

"No discussion of the tobacco industry in the year 2000 would be complete without addressing what may be the most important feature on the landscape, the China market. In every respect, China confounds the imagination."

– Rene Scull, VP-Philip Morris Asia (1986)

"Thinking about Chinese smoking statistics is like trying to think about the limits of space."

- Rothmans document (1990)



Facing the Challenge



World Bank. Curbing the epidemic: Governments and the economics of tobacco control. World Bank Publications, 1999. p80.


The World Responds to the Growing Tobacco Epidemic

 1999–2003: negotiations for an international response to the growing tobacco threat

Framework Convention on Tobacco Control



FCTC: Unanimously Adopted—May 2003



HIC

Demand Reduction Provisions of the FCTC

- More prominent warning labels
- Elimination of "misleading descriptors"
- Bans/restrictions on advertising, promotion, sponsorship
- Protection from exposure to tobacco smoke
- Higher taxes
- Support for cessation
- Education, communication, public awareness



Potential of Policies to Flatten the Curve



Impact of policies depends on factors including:

- Intervention date
- Effect size



World Bank. Curbing the epidemic: Governments and the economics of tobacco control. World Bank Publications, 1999. p80.

Article 8 Protection from exposure to tobacco smoke

2. Each Party shall adopt and implement in areas of existing national jurisdiction as determined by national law and actively promote at other jurisdictional levels the adoption and implementation of effective legislative, executive, administrative and/or other measures, providing for protection from exposure to tobacco smoke in indoor workplaces, public transport, indoor public places and, as appropriate, other public places.

What does "effective" mean?



Article 11—Warnings and messages

- should be 50% or more of the principal display areas but shall be no less than 30%...
- may be in the form of or include pictures or pictograms
- shall contain information on relevant constituents and emissions

"Each Party shall, within a period of three years after entry into force of this Convention for that Party, adopt and implement, in accordance with its national law, effective measures..."

What does "effective" mean?

Does size matter? Are graphic images effective?



Opportunities Afforded by the FCTC

Opportunity for science:

Time-limited opportunity to study population-based interventions: (1) measure the impact of policies and (2) identify the causal mechanisms for policy impact

Opportunity for evidence-based policy:

 Create the evidence base to inform the creation of effective tobacco control policies

Determine the relative strength of FCTC policies

 Counteract disinformation and misinformation from the tobacco industry "Tobacco use is unlike other threats to global health. Infectious diseases do not employ multinational public relations firms. There are no front groups to promote the spread of cholera. Mosquitoes have no lobbyists."

– WHO Zeltner Report (2000)



Tobacco Industry: Distorting Science

- Creation of front groups to cast doubt on the evidence of the harms of smoking and then of second-hand smoke
- Payment to "neutral" scientists for results-directed research
- Creation of entire research programs to "generate a body of scientific and technical knowledge [through research] undertaken by whitecoats."





- JunkScience.com founded by a front group created by Philip Morris in 1993
- To cover up the association with PM, the front group aimed to link scientific studies that cast smoking in a bad light with "broader questions about government research and regulations" - such as "global warming", "Inclear waste disposal" and "biotechnology".

"Doubt is our product."



Challenges to Evaluating Policies

- Not possible to conduct randomized controlled trials (RCTs) on policies
- But it is possible to evaluate the impact of policies using natural experiments ("quasi-experiments")
 - 1. Multiple country comparisons: international studies
 - 2. Common methods and measures across countries
 - 3. Cohort studies: focus on impact on individuals



What do we need?

- An international system for measuring policy-relevant variables and variables over time
- Common measures selected from a strong, theorydriven perspective
- Common research designs and protocols
- Strategic selection of countries to:
 - evaluate policy via natural experiments

 test for generality vs. specificity of policy impact across countries and across implementation strength



The International Tobacco Control Policy Evaluation Project



ITC Survey Research Team

Canada

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Thailand

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Netherlands*

Marc Willemsen

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Marine Gambarvan

United Kingdom

Gerard Hastings Ann McNeill Louise Hassan Anne Marie Mackintosh **Fiona Harris**

China

Jiang Yuan Yang Yan Feng Guoze

Germany

Martina Pötschke-Langer Sven Schneider

India*

Prakash Gupta **Dhirendra Sinha** Prabhat Jha

Sudan* Asma Elsony

* ITC Surveys currently in development

The ITC Surveys

- Extensive surveys of representative samples of adult smokers in each country
- ITC Methods: as rigorous as the conditions will allow
- Identical/similar methods/measures in all countries
- Measures of each FCTC demand policy
- Cohort survey: same individuals surveyed every year



The ITC Surveys

Country	Mode	N (smokers)	N (others)	2002	2003	2004	2005	2006	2007	2008
Canada		2,000								
United States		2,000								
United Kingdom	12	2,000								
Australia		2,000								
Ireland/Scotland		2,000	900 NS							
Thailand	22	2,000	1,000 Youth							
Malaysia	22	2,000	1,000 Youth							
South Korea		1,000								
China		5,600	1,400 NS							
Mexico		1,000								
Uruguay		1,000								
New Zealand		2,000								
France		1,700	500 NS							
Germany		1,700	1,000 NS							
Sudan		6,000 ?	2,000 SL,NS							
Bangladesh	22	3,000 ?	1,000 SL,NS							
India		12,000 ?	2,000 SL,NS							

Policy Evaluation Project

ITC Project Goals

Goal 1: Rigorous evaluation of national-level tobacco control policies of the FCTC:

Goal 2: To understand <u>how</u> and <u>why</u> these policies work (if they work)

What's inside the black box?

Goal 3: Disseminate findings to policymakers

Build evidence base for FCTC

– Promote evidence-based policies





Mediational Model(s) of Policy Effects





Warning Labels: Article 11 of the FCTC Evidence from the ITC Project

- 1. Quasi-experimental evaluation of the enhancement of warning labels in the U.K.
- 2. Comparing responses to warning labels across 7 ITC countries (including China)

Tobacco Warning Labels as a Health Intervention

- Frequency of exposure is high
 - Pack a day smoker: 7,300–9,125 possible exposures
- Location and delivery of the intervention is ideal
 - Delivered at the time of the purchase
 - Delivered at the time of the behavior
- Objectives of warning labels:
 - To inform the public about the (wide-ranging) harms of smoking
 - To inform the public about the severity of the health harms
 - To convey the information in a vivid manner



Smokers notice information on warning labels



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Smokers rank cigarette packs very highly as a source of information—and labels are <u>very</u> cost effective compared to television

Warning Labels and the FCTC

Article 11—Warnings and messages:

- should be 50% or more of the principal display areas but shall be no less than 30%...
- may be in the form of or include pictures or pictograms
- shall contain information on relevant constituents and emissions



Canadian Graphic Warning Labels



Canada's labels are not just about the graphic photos. The explanation enhances the text. The graphic image is <u>integrated</u> with the text.



Warning Labels in the U.S. vs. Canada

United States Canada WARNING UNDERAGE SALE PROHIBITED CIGARETTES **CAUSE MOUTH** DISEASES Cigarette smoke causes oral cancer, gum diseases and tooth loss. **Health Canada** MACDONALD EXPORTA - Since 1984 - Since 2001 – 4 messages – 16 messages - Side of pack - 50% of front and back - New set coming in 2008



Examples of Graphic Warnings





International Tobacco Cont



Enhancing warning labels increases label salience/noticing



The enhancement of warning labels in the U.K. had a huge impact on labels salience/noticing. But this is a measure of noticing, where mere novelty alone would be expected to have a huge effect

Labels and thinking about quitting



Initial advantage of the UK over Canada vanishes. And proper comparison of Canada vs. UK at the same point in time after the introduction of warnings (2.5 years) shows Canada > UK.

Do warning labels increase knowledge?

Smoking causes impotence:	Canada	Aus.	U.K.	U.S.	
Wave 1	TOBACCO USE CAN TOBACCO USE CAN MICK YOU IMPOTENT In Carbon of Conservation and Carbon of Conservation State to decreased folded frow the hopesit. This can prevent you thinking as ensetion. Neat Carbo	36	36	34	
Wave 2	WARNING TOBACCO USE CAN MAKE YOU IMPOTENT Gystrifts may couse steady and the parks. This can proved you for the parks. This can prove the you for the parks. This can prove the you for the parks. This can prove the you for the parks. This can prove the parks. This can prove you for the parks. This can prove the parks. This can prove the you for the parks. This can prove the parks. This can prove the you for the parks. This can prove the parks. This can prove the you for the parks. This can park the parks. This can park the you for the parks. This can park the parks. This can park the you for the parks. This can park the parks. This can park the you for the parks. This can park the parks. This can park the parks. This can park the you for the parks. This can park the park the parks. This can park the park the parks. This can park the parks. This can park the parks. This can park the park t		TOBACCO USE CAN MAKE YOU IMPOTENT Gyaritism mar cases sensal months to decrease their net the pases. This cas provest you for the pases. This cas provest you for the pases. This case provest you for the pase. This case provest you for the pases. This case provest you for the pase. This case provest you for the part of the pase. This case provest you for the pase. This case pase part of the pase. This case part of the p		

Only Canada had a warning label about impotence at Wave 1, but then U.K. added an impotence label between Wave 1 and Wave 2



Do warning labels increase knowledge?



Substantial increase in knowledge about impotence in the U.K. compared to the other three countries after the label on impotence was introduced in the U.K.

In U.K.: 14% more smokers = About 1.5M smokers In China: 14% more smokers = About 50M smokers

Policy Evaluation Project

Implications for FCTC Implementation

Minimal Standard vs. Recommendations:

- should be 50% or more of the principal display areas but shall be no less than 30%...

should be -may be in the form of or include pictures or pictograms

Results from the ITC Project suggest that countries who implement the FCTC label policy at its highest level will experience greater impact, compared to the minimal standard



Warning Labels of Seven ITC Countries at the Time of the 2005 Survey Wave





And this is also true in China: the labels are noticed by a high proportion of the population (51%)




And the same is true in China: although the <u>potential</u> is very high (high levels of noticing), the <u>impact</u> on this critical factor is low. <u>Warning labels should be strong to take advantage of the opportunity</u>

Relationship Between Labels and Quitting



Smokers who report that the labels make them more likely to think about risks of smoking were:

- more likely to **attempt to quit** $(OR = 1.14)^*$
- more likely to successfully quit (OR = 1.89)*

* Statistically significant at p < .05

Controlling for Gender, Age, Income, Education, Ethnicity, Prior Quit Attempts, Intentions to Quit





The Impact of Comprehensive Smokefree Legislation (Article 8): Findings from the ITC-Ireland/UK Survey

Tobacco Smoke Pollution: Facts and Figures

- Scientific consensus that TSP (ETS):
 - is a known cause of cancers, cardiovascular diseases, and respiratory diseases
 - contains 5 regulated hazardous air pollutants, 47 regulated (in the U.S.) hazardous wastes, 60 known or suspected carcinogens, and >100 chemical poisons
- Third leading cause of preventable death in the U.S., accounting for one death among nonsmokers for every eight deaths among smokers.



US EPA Air Quality Index

Air Quality	ΡΜ_{2.5} (μg/m³)	Health Advisory
	≤15	None.
Moderate	16-40	Unusually sensitive people should consider reducing prolonged or heavy exertion.
Unhealthy for Sensitive Groups	41-65	People with heart or lung disease, older adults, and children should reduce prolonged or heavy exertion.
Unhealthy	66-150	People with heart or lung disease, older adults, and children should avoid prolonged or heavy exertion. Everyone else should reduce prolonged or heavy exertion.
Very Unhealthy	151-250	People with heart or lung disease, older adults, and children should avoid all physical activity outdoors. Everyone else should avoid prolonged or heavy exertion.
Hazardous	≥251	People with heart or lung disease, older adults, and children should remain indoors and keep activity levels low. Everyone else should avoid all physical activity outdoors.



Hayman Fire – Worst in Colorado History – June 8, 2002

Denver

GLENWOOD SPRINGS

Colorado

PIKE NATIONAL FOREST June 9, 2002

COLORADO SPRINGS



TRINIDAD



Denver's visibility – 1 day after Hayman fire Worst PM 2.5 - 43 µg/m³ (24-hr max) or 200 µg/m³ (hourly max)





PM2.5 Levels in Car 4: 2 cigarettes smoked in 30-min period All windows up and Air Conditioning On



Sendzik, Fong, Travers, & Hyland (2006)

Article 8 Protection from exposure to tobacco smoke

2. Each Party shall adopt and implement in areas of existing national jurisdiction as determined by national law and actively promote at other jurisdictional levels the adoption and implementation of effective legislative, executive, administrative and/or other measures, providing for protection from exposure to tobacco smoke in indoor workplaces, public transport, indoor public places and, as appropriate, other public places.

What does "effective" mean?



Ventilation is NOT a solution!



Smoke-Free Laws: Basic Questions

Do they work? Will people comply?
Will smokers accept the law?
What is the economic impact?



International Tobacco Control Policy Evaluation Project: Ireland/UK Survey

Telephone Survey

Ireland: 1,000 randomly selected adult smokers

- U.K.: 600 randomly selected adult smokers
- Cohort design:

Wave 1: Dec 2003–Jan 2004 Workplace Ban: Mar 29, 2004 Wave 2: Dec 2004–Jan 2005





International Tobacco Control

Other ITC findings showing that the Irish law reduced tobacco smoke pollution

- 94% of Irish smokers reported that pubs were enforcing the law "totally"
- 98% of Irish smokers (vs. 35% of UK smokers) said that there was less smoke in pubs than one year ago

Conclusions:

- 1. The smoke-free law led to near-total elimination of smoking in key public venues in Ireland (especially in pubs)
- 2. A very high proportion of U.K. workers continue to be exposed to tobacco smoke



Smoke-free pubs lead to smoke-filled homes?



John Reid, former U.K. Secretary of State for Health, at a House of Commons Health Committee Evidence Hearing, Feb. 23, 2005:

In Scotland, for instance, they have decided to go for a complete ban on smoking. I came to the conclusion that that was not a good thing on health grounds, apart from anything else, because you get a displacement of smoking from some public areas to the home - and most of the evidence about passive smoking is about the home...

...what we do know, for instance in Ireland and we would anticipate in Scotland, is that a percentage of people who previously went to the pub to smoke will now get a carry-out and take it home. Ithink the percentage in Ireland is about 15 per cent.





Proportion of homes allowing smoking has <u>decreased</u> in Ireland since the ban (p=.002): Home bans have <u>increased</u> after the ban





Substantial increase in support among adult smokers in Ireland after the ban was implemented. Same results in other venues.



Ireland's Legislation: Massive Cultural Shift





Smoke-Free Laws: Basic Questions

Do they work? Will people comply?
 YES: after initial adjustment, compliance is very high

Will smokers accept the law?
 YES: majority of smokers

 What is the economic impact?
 21 best-designed evaluation studies of economic impact: 0 show negative impact



Compensatory Model of Price Effects



Does cutting back represent a real health benefit, or is it offset by compensation (smoking more of cigarette, inhaling more deeply)?



Evaluating Non-Policy Population Interventions



- "Tak Nak": First-ever national anti-smoking campaign in Malaysia
- Malaysian MOH partners with the ITC Project to evaluate the Tak Nak Campaign
- Questions added to ITC Malaysia Survey to evaluate Tak Nak



ITC China Project

- Collaboration between the ITC Project and the Chinese Office of Tobacco Control (China CDC)
- FTF cohort survey in 7 cities: Beijing, Shanghai, Changsha, Guangzhou, Yin Chuan, Shenyang, Zhengzhou.
 Total N = 5,600 smokers + 1,400 non-smokers



- Being used by China Government for FCTC surveillance
- Wave 1 survey fieldwork: May–November 2006



Potential ITC Evaluation of Smoke-Free Initiative for the 2008 China Olympics

	ITC City	2007			2008				2009				
	Beijing				ITC				ITC	?	?	?	ITC
Olympic Cities	Shan ghai				ITC				ITC	?	?	?	ITC
	Shenyang				ITC				ITC	?	?	?	ITC
Non- Olympic Cities	Yin chua n				ITC				ITC				ITC
	Guang zhou				ITC				ITC				ITC
	Changsha				ITC				ITC				ITC
	Zheng zhou				ITC				ITC				ITC



The ITC Paradigm: not just about tobacco

- The individual-level approach to evaluation is the proper unit of analysis.
- <u>Any</u> population-level approach to changing behaviour can be evaluated and its impact understood via this paradigm
 - Physical activity and eating behaviour
 - Conservation behaviour
 - Different mediating variables: same principles of evaluation!!



Evidence-Based Policies for Global Health

- Begins with the establishment of a surveillance and evaluation system of health behaviour at the population level
- Must be at the individual level
- Must be mutually informed by policymakers and stakeholders (of course) but in close collaboration with experts in health behaviour
- The ITC paradigm offers a flexible approach to understanding the impact of population-level interventions across domains.



Future Possibilities?



 Interventions for lessening the progression of global warming: What works? How can interventions be created for greater effectiveness?

How can we evaluate their effectiveness?



International Tobacco Control Policy Evaluation Project http://www.itcproject.org http://www.roswelltturc.org



(P50 CA111236)







of Health Research

ITC Project Research Support



International Tobacco Control

Policy Evaluation Project