MOVING TOWARDS A SMOKE-FREE SOCIETY *QUICKLY*

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Policy Effect Sizes: Demand Reduction Policies

Intervention	Short Run†			Long Run‡		
	Best	Lower	Upper	Best	Lower	Upper
Tax increase at 50% of current price	-9.0%	-6.75%	-11.25%	-18.0%	-13.5%	-22.5%
Comprehensive smoke-free air laws, including all indoor worksites, restaurants and bars	-10.0%	-5.0%	-15.0%	-12.5%	-7.0%	-19.0%
Media campaigns implemented at a high level	-8.0%	-4.0%	-12.0%	-10.0%	-6.0%	-14.0%
Comprehensive programs, including media, other educational and cessation programs	-8.0%	-4.0%	-12.0%	-12.0%	-6.0%	-18.0%
Media campaigns implemented at a high level	-8.0%	-4.0%	-12.0%	-10.0%	-6.0%	-14.0%
Comprehensive programs, including media, other educational and cessation programs	-8.0%	-4.0%	-12.0%	-12.0%	-6.0%	-18.0%
Health warnings. Large, bold, rotating and graphic	-5.0%	-2.0%	-8.0%	-10.0%	-5.0%	-15.0%
Marketing restrictions with direct bans on all advertising	-4.0%	-2.0%	-6.0%	-6.0%	-3.0%	-9.0%
Cessation policies, including financial coverage of all treatments, quit lines and health care provider intervention	-5.5%	-2.75%	-8.25%	-11.0%	-5.5%	-18.5%

† short run = 5 years, ‡ long-run 30 years. Source: Levy et al., Journal of Pub Health Mgmt and Practice, 2018

Issues

- The effect sizes above apply in going from no policies at all to complete implementation. Actual effects will be much smaller, since all states have some policies
- Federal vs. state vs. local policies can have different effects based on the extent of coverage
- Knowledge of the effect of combined policies is weak
- Dual use of cigarettes with other forms of tobacco isn't taken into account. Dual use with smokeless tobacco, cigars and/or e-cigarettes is increasingly common. Reviewed studies are almost entirely pre-e-cigarettes.

Computational/Simulation Models

- Simulation/computational models are used in other fields, but are increasingly common in public health, especially in the fields of tobacco control and obesity
- They take into account past trends in usage rates and other factors, including policies, to predict future trends.
- The results below were developed using the *SimSmoke* Tobacco Control Policy Simulation model

Successes due to past tobacco policies using the SimSmoke Simulation Model

Percent reduction in smoking prevalence

- > 30% reduction
  - Brazil (almost 50% reduction due to policies over 20 years, PLOS Med 2012)
  - California 30% over 15 years (Health Policy 2007)
  - US, 50% over 1965-2012 (JAMA 2014)
- At least 25% Reduction
  - United Kingdom over 12 years (EJPH 2012)
  - Minnesota over 15 years (AJPM 2012)
  - Thailand over 15 years (Tob Control 2008)
  - Mexico over 12 years (PAHO 2012)
- 20% Reduction
  - Arizona over 15 years (JPHMP 2007)
  - Korea over 12 years (AJPH 2010)
  - Ireland over 15 years (Tob Control 2012)
  - Netherlands over 14 years (Addiction 2012)

The Effect of Future Policies Depends on Past Policies: EU Nations, Male Smoking Prevalence*

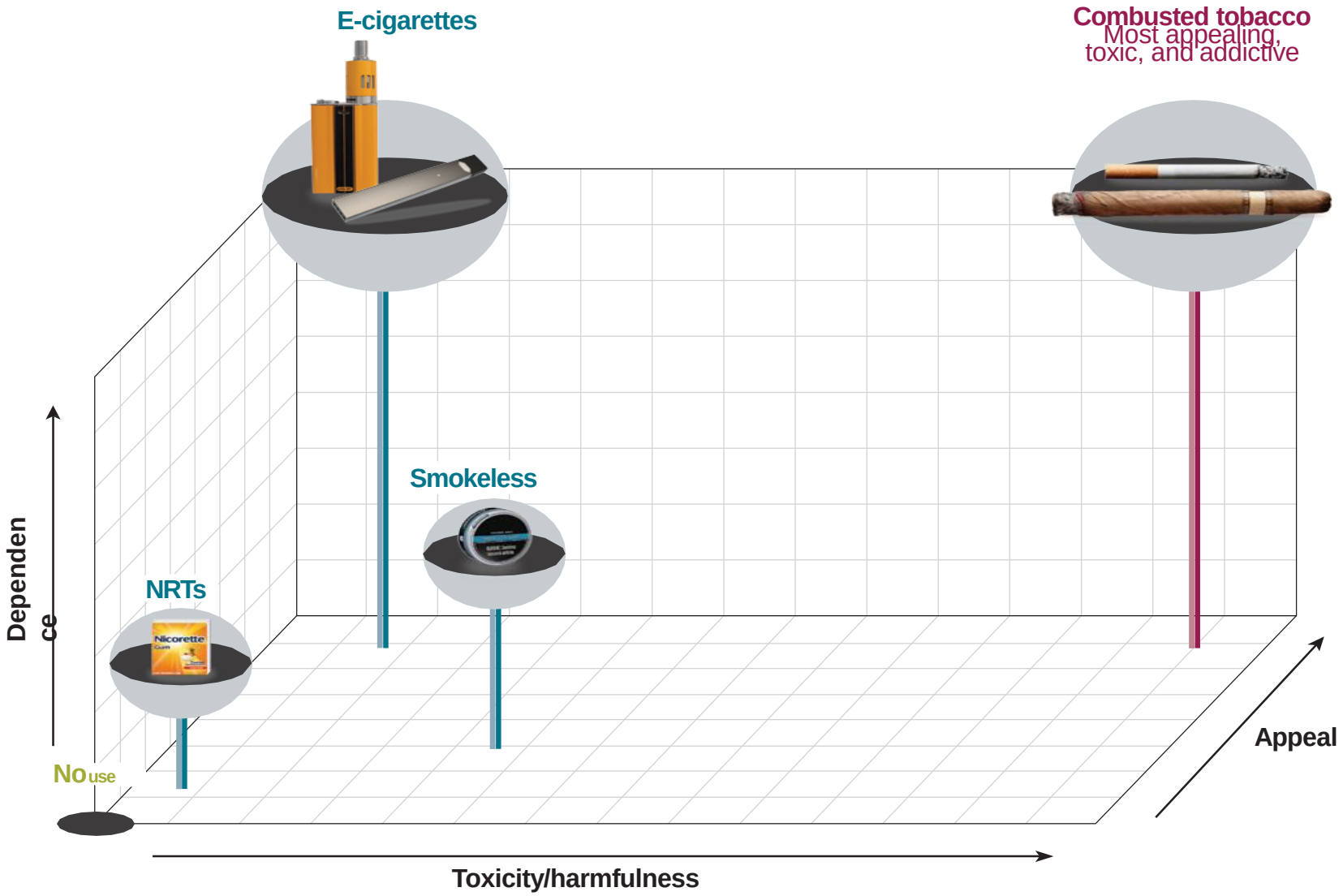
	Status quo	Predicted Future Under Status Quo	w/FCTC consistent policies	
POLICY/YEARS	2010	2040	2040	% change
ALBANIA	63.3%	57.9%	26.3%	-54.5%
CZECH REPUBLIC	34.6%	27.5%	16.4%	-40.1%
FINLAND	25.2%	19.5%	12.8%	-34.6%
FRANCE	27.1%	21.5%	14.7%	-31.6%
GERMANY	31.3%	25.5%	15.7%	-38.2%
GREAT BRITAIN	22.8%	18.6%	13.6%	-26.7%
IRELAND	26.1%	20.0%	13.5%	28.9%
ITALY	26.8%	20.3%	13.4%	-34.0%
NETHERLANDS	29.6%	23.1%	14.0%	-39.5%
POLAND	63.3%	57.9%	26.3%	-54.5%
RUSSIA	61.1%	59.1%	26.3%	-55.6%
SPAIN	31.7%	22.5%	14.6%	-34.9%
SWEDEN	22.3%	16.6%	10.6%	-36.3%
TURKEY	43.4%	37.5%	24.7%	-34.1%
UKRAINE	49.6%	35.9%	15.3%	-57.4%

* Levy, DT, Huang A-T, Currie L, Clancy L, The benefits from complying with the Framework Convention on Tobacco Control: a Simsmoke analysis of fifteen European nations. Health Policy and Planning, 2014 Dec;29(8):1031-42.

There may be limits to current policies: We will likely need more than traditional policies to reduce smoking by more than 50%

- **Those with the weakest current policies (e.g., Russia) show the potential for largest reductions in smoking prevalence, with forecasts of about a 50% reduction in smoking prevalence in going from very limited policies to fully FCTC-consistent policies**
- **How can we surpass a 50% reduction?**
  - Supply-oriented policies, such as reduced nicotine delivery cigarettes
  - Provide better substitutes=> alternative nicotine delivery systems available, e.g., reduce nicotine and other addictive constituents or disallow current cigarettes in favor of safer forms of tobacco

Risk and Appeal Continuum



Simulation Modeling: Potential deaths averted in US by replacing cigarettes with e-cigarettes.

Replacement of cigarette by e-cigarette use over a ten-year period yields 6.6 million fewer premature deaths with 86.7 million fewer life years lost in an Optimistic Scenario, and 1.6 million premature deaths averted with 20.8 million fewer life years lost Under the Pessimistic Scenario. The largest gains are among younger cohorts, with a 0.5 gain in average life expectancy projected for the age 15 cohort in 2016.

How do we encourage such replacement? We need a two pronged approach: Make cigarettes less desirable and make alternatives more desirable.

- Levy, Borland, Lindblom, Goniewicz, Meza, Holford, Yuan, Luo,O'Connor, Niaura, Abrams. Tobacco control. Online First, October 2, 2017
- Levy DT, Cummings KM, Villanti AC, et al. A framework for evaluating the public health impact of e-cigarettes and other vaporized nicotine products. Addiction. 2017;112(1):8-17.
- Levy DT, Borland R, Villanti AC, et al. The Application of a Decision-Theoretic Model to Estimate the Public Health Impact of Vaporized Nicotine Product Initiation in the United States. Nicotine Tob Res.2017;19(2):149-159.

Suggested Approach: Movement to A Smoke-free Society *Quickly*

- Large increase in cigarette taxes, stronger health warnings
- Limit nicotine content (menthol?) in cigarettes
- Limit youth access to nicotine delivery products of all kinds, raise the minimum legal age of purchase with stronger enforcement.
- Encourage innovation in e-cigarettes, HnB and their use as cessation devices, including through health care. Competition in the market for nicotine delivery products is essential!

Can we reach an endgame, i.e., 5% or less

We will only know if we make a serious try?