

# Do Smokers have Differential Demand for Conventional, Very Low Nicotine, and Electronic Cigarettes?

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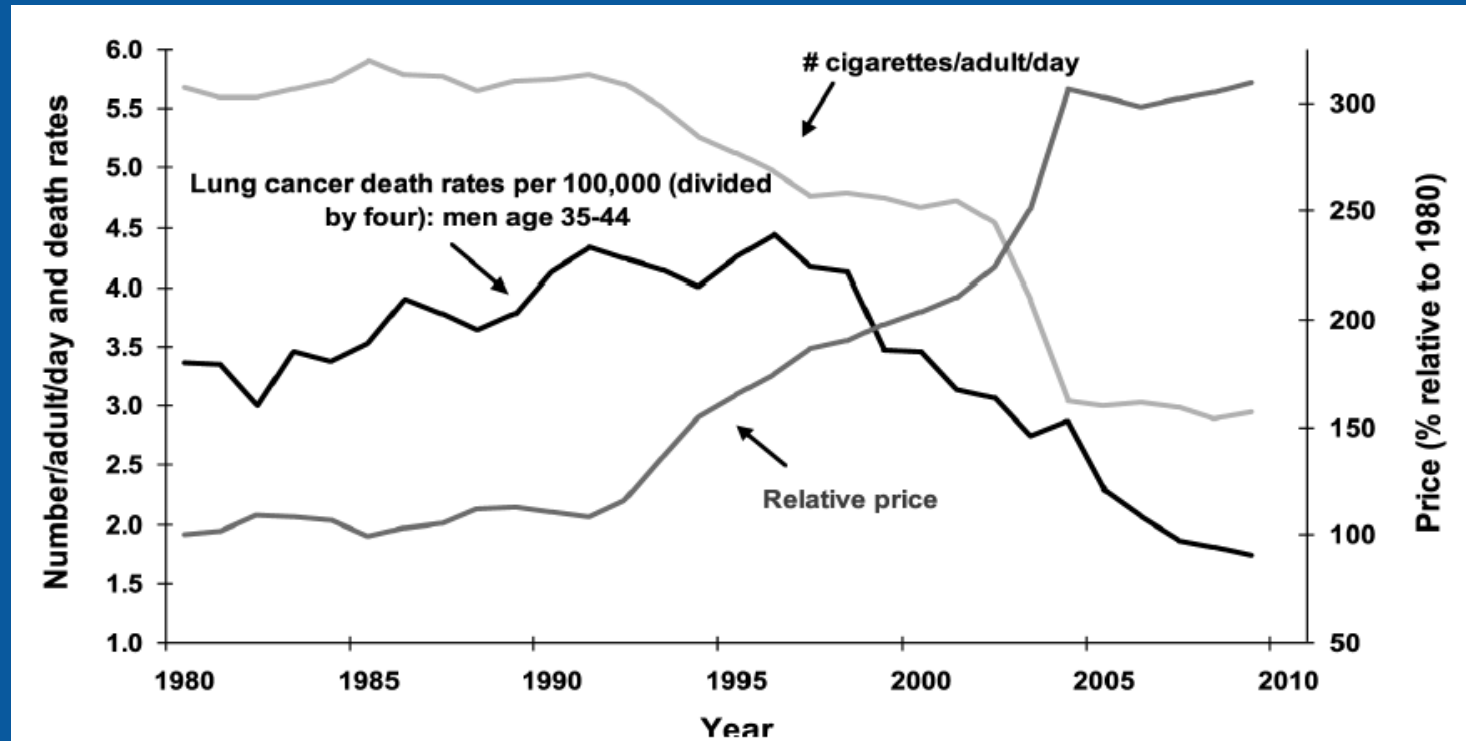
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# Impact of Price



(Jha, 2009)

WHO FCTC, Article 6: Price and Tax Measures to Reduce the Demand for Tobacco

# Impact of Price

IARC Handbooks of Cancer Prevention, Tobacco Control, Vol. 14:  
Effectiveness of Tax and Price Policies for Tobacco Control (2011: Lyon, France)

- Never smokers/experimenters
  - Reduced initiation
  - Reduced transition
- Smokers
  - Increased quitting
  - Reduced consumption
  - Substitution of alternative products
- Former Smokers
  - Relapse prevention

# Macroeconomic Approach

- Population-level data on consumption and price
  - Elasticity = change in consumption relative to 1% increase in price
    - $>1$  = elastic
    - $<1$  = inelastic
- Varies by
  - Country: developed (-.4) < developing (-.6)
  - Age: adult (-.4) < youth (-.9)
  - Income: lower < higher
- Primary limitation: range in price

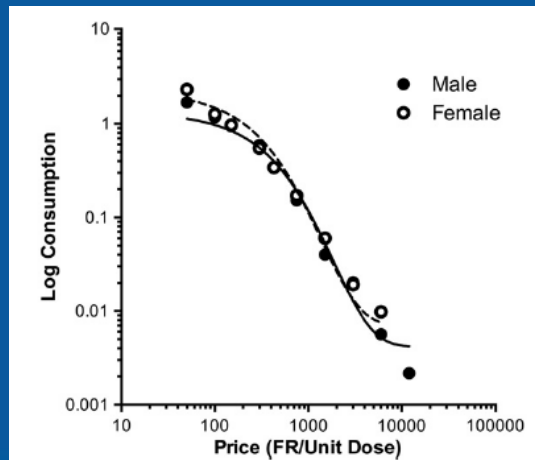
# Behavioral Economic Approach

- Individual-level data on consumption across a range of prices (Hursh & Silberberg, 2008)

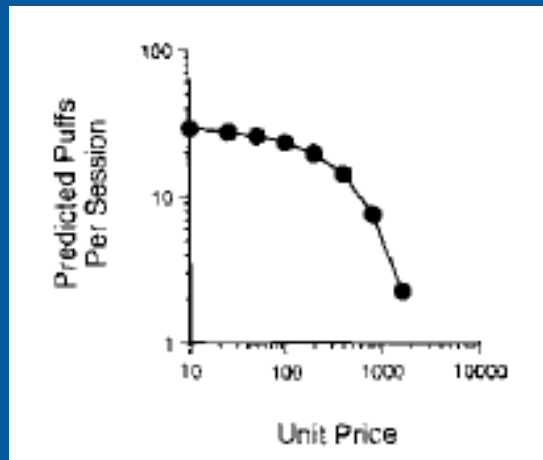
$$\log Q = \log Q_0 + k \left( e^{-\alpha(Q_0 C)} - 1 \right)$$

- Elasticity ( $\alpha$ ) = slope of the demand curve
- Translational framework to quantify reinforcement

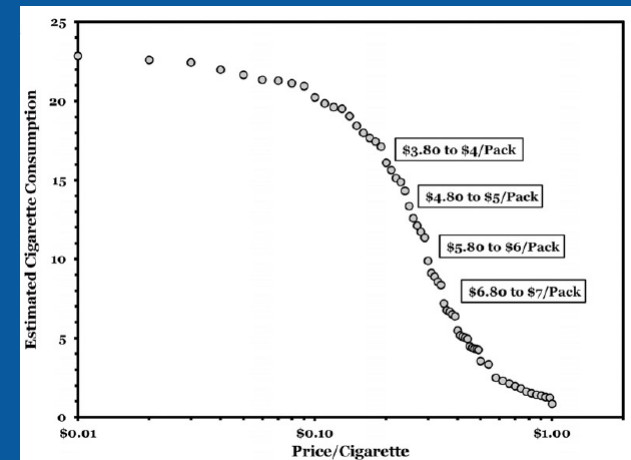
Grebenstein et al., 2013



Bickel & Madden, 1999



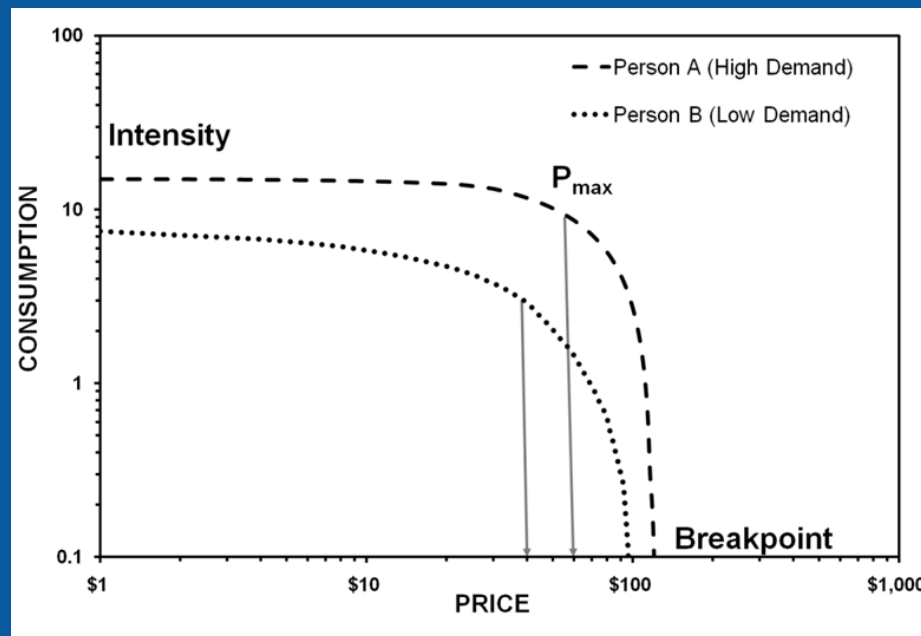
MacKillop et al., 2012



# Purchase Tasks

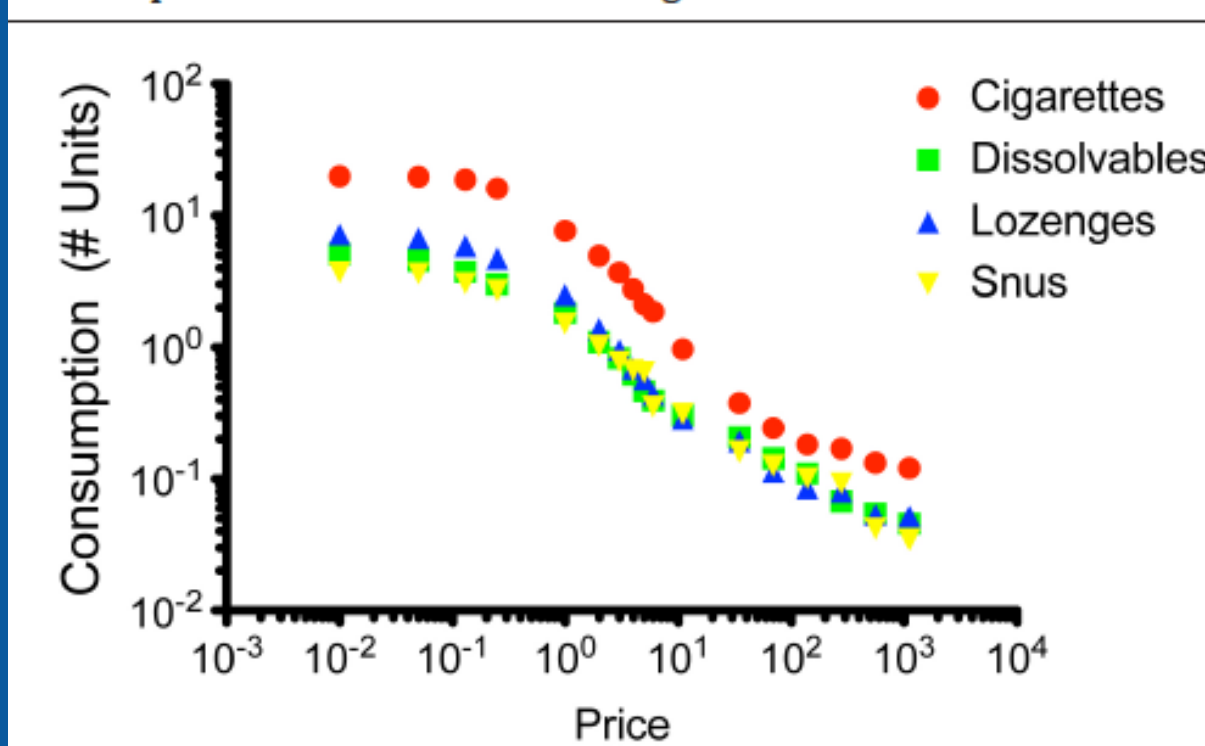
(Bickel/MacKillop/Murphy)

- Intensity (consumption at zero cost)
- Omax (maximum financial expenditure)
- Pmax (price at which expenditure is maximized)
- Breakpoint (first price at which consumption is zero)
- Elasticity (sensitivity of consumption to increased cost)



# Estimating Demand for Alternatives to Cigarettes with Online Purchase Tasks

Mean Exponential Demand Curves for Cigarettes and Alternative Products



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# Modified Risk Tobacco Products

- “any tobacco product that is sold or distributed for use to reduce harm or the risk of tobacco-related disease associated with commercially marketed tobacco products”
  - Abuse liability (e.g., nicotine levels)
  - Toxicant exposure (e.g., non-combustible)
- Family Smoking Prevention and Tobacco Control Act was passed in 2009
  - FDA authority to regulate tobacco products



# Current Study

**Predicting consumer interest in using a very low nicotine cigarette (VLNC)**

- Parent study included 2000 smokers and 1000 non-smokers from the Netherlands
- Subsample of 1215 daily smokers
  - 14 CPD (SD=7); 24% had used e-cig within 30 days
  - 51% female; 44% age 16-24 (M=38; SD=12)
  - 14% had bachelor's degree; Mdn income of €22,500
  - 30% had made quit attempt in last 6 months, and 5 % intended to do so within the next 3 months

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Principal Investigator: K. Michael Cummings, Ph.D.

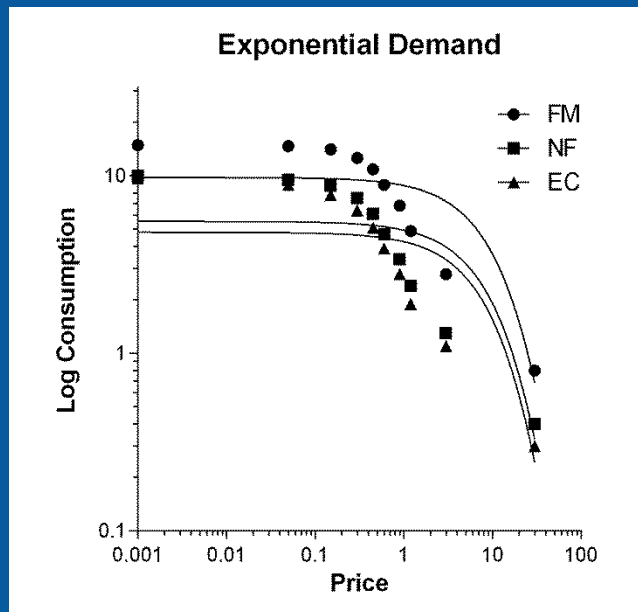


# Differential Demand

- How many \_\_\_ cigarettes would you smoke over the next 24 hours if they were €\_\_ each?

Product: ordinary factory made (FM), nicotine free (NF), electronic (10 puffs = 1 EC)

Price: .00, .05, .15, .30, .45, .60, .90, 1.20, 3, 30



	Product		
	FM	NF	EC
Intensity	14.7	9.6	8.8
Omax	12.2	5.6	4.3
Pmax	4.5	2.2	2.0
Breakpoint	16.4	11.8	11.9
Elasticity	0.05	0.22	0.24

\*\*\*All FM vs. NF and FM vs. EC comparisons significant at  $p < .001$

# Moderators

- Candidates
  - Age, gender, income, education, CPD, EC use, & motivation to quit
- FM vs. NF
  - Greater differential demand among those who were younger, heavier smokers, and less educated
- FM vs. EC
  - Greater differential demand among heavier smokers, and those who had not used an EC recently (30 days)

# Conclusions & Future Directions

- MRTPs (NF and EC) are more sensitive to cost
- Substitution rates likely to be low, unless cost is substantially lower for MRTPs
  - Price: tax by harm, retail sales policies
  - Non-price: availability, appeal, relative risk information
- Cross-price elasticity studies
- Sampling studies
- Translational paradigm
  - animal laboratory, human laboratory, human clinical, human marketplace

# Thanks for listening!

## ITC Project Research Organizations



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