

Differential Demand for Conventional, Very-Low Nicotine, and Electronic Cigarettes in the Netherlands

Heckman BW¹; Nahhas GJ¹; Cummings KM¹; Borland R²; O'Connor RJ³; Carpenter MJ¹
¹Medical University of South Carolina, ²Cancer Council Victoria; ³Roswell Park Cancer Institute



INTRODUCTION

- Cigarettes are the most commonly consumed tobacco product globally, accounting for 92% of the manufactured tobacco market share
- Nicotine delivery is the primary mechanism through which cigarettes attain their reinforcement value and addictive potential
- Conventional factory made cigarettes (FMC) have enhance the efficiency of nicotine delivery
- There are 2 methods to reduce factory made cigarettes (FMC) cigarette consumption
 - Introducing very low nicotine cigarettes (VLNC)
 - Conversion to non-combustible nicotine products such as electronic cigarettes (EC)

- VLNCs reduce cigarette consumption and may have value as smoking cessation aids
- Smoking-related morbidity and mortality might be reduced if smokers switched from FMC to EC
- EC reduce cravings to smoke, cigarette consumption, and increase the odds of quitting smoking
- Demand for such products may allow forecasting of product uptake and impact on the FMC use

OBJECTIVE

To assess whether smokers had differential demand for FMC, VLNC, and EC using a behavioral economic approach.

METHODS

- Participants were recruited by a commercial online survey research firm
- 1512 participants in a web-based consumer panel in the Netherlands of current smokers
- Current smoking status was defined as cigarette use within the past 30 days
- Participants completed purchase tasks for FMC, VLNC, and EC
- Demographics, interest in using different products, perceptions & attitudes towards smoking, and quitting history were assessed
- Participants indicated the number of FMC, VLNC, or EC they would consume if they each cost: €0, €0.05, €0.15, €0.3, €0.45, €0.6, €0.9, €1.2, €3, €30

- Five demand indices were generated:
 - Intensity:** cigarette consumption at the lowest price
 - Breakpoint:** first price at which cigarette consumption is zero
 - Pmax:** price at which consumption starts to decline
 - Omax:** maximum financial expenditure
 - Elasticity:** sensitivity of consumption to increases in cost
- Multivariable analyses of demand were modeled using repeated-measures generalized estimating equations (GEE)
- Moderation by age, HSI, factory-made-roll-your-own (FM-RYO) cigarette use, quit motivation, and past 30-day use of EC were examined

RESULTS

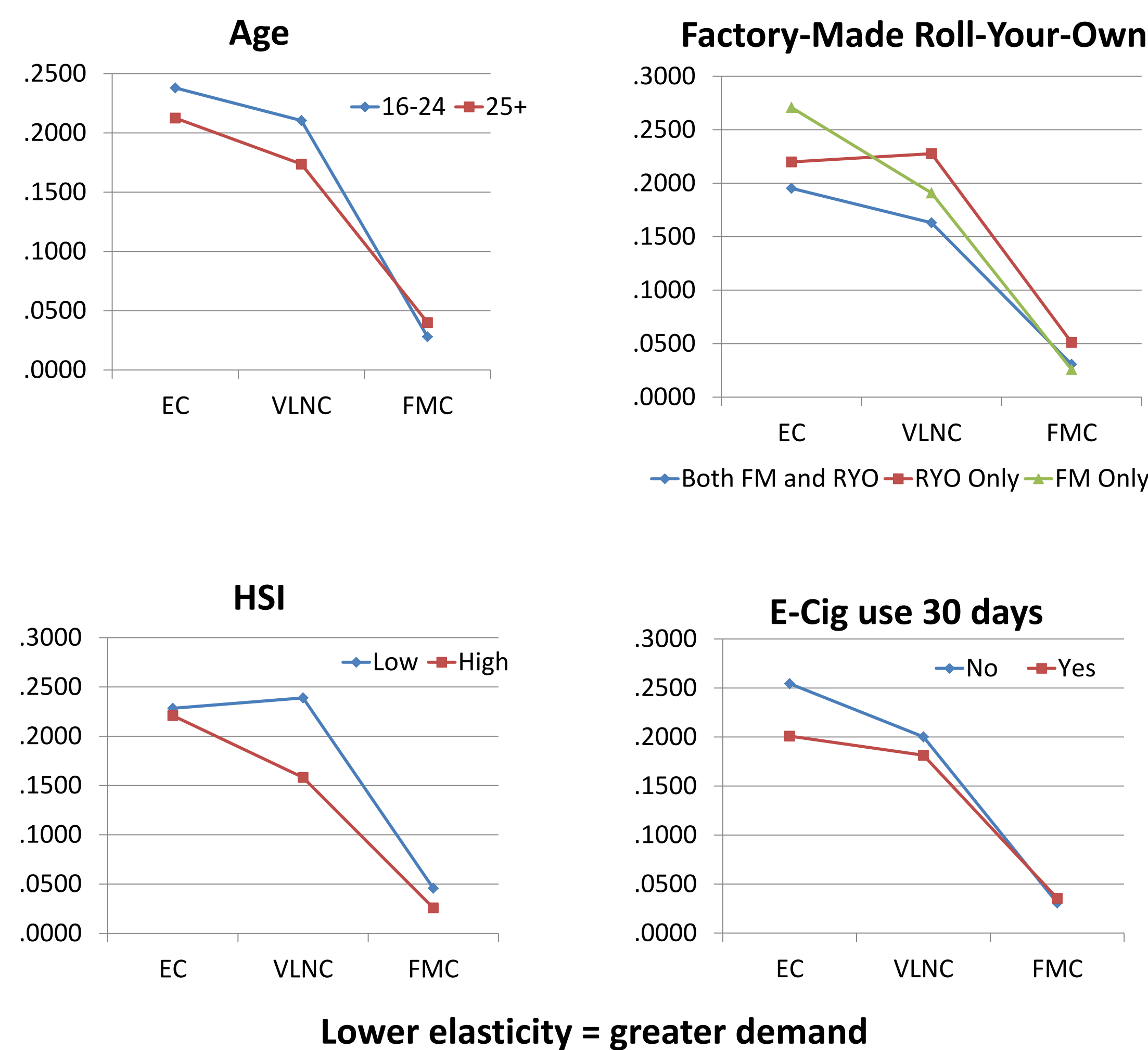
- 51% were female
- Average age was 37.9 ± 18.2
- Smoked 13.8 ± 7.4 cigarettes/day
- 24% used EC within the past 30 days
- Median income was €22,500
- 14% had a bachelor's degree
- 30% had made a quit attempt in the previous 6 months
- 5% intended to make a quit attempt within the next 3 months
- Elasticity is a comprehensive index that accounts for demand across all price points

Test of adjusted overall type 3 model effects for indices of demand.

	Elasticity	Intensity	Omax	Breakpoint	Pmax
Product	✓	✓	✓	✓	✓
Quit Motivation	✓	✗	✓	✓	✗
E-cigarette use in the past 30 days	✗	✓	✓	✗	✗
Heaviness of Smoking Index (HSI)	✓	✓	✓	✓	✗
Age	✗	✗	✗	✓	✓
Sex	✗	✗	✗	✗	✗
Income	✗	✗	✗	✗	✗
Education	✗	✗	✗	✗	✓
FM-RYO Cigarettes	✓	✓	✗	✗	✗
Product * Age	✓	✓	✗	✗	✗
Product * HSI	✓	✗	✓	✗	✓
Product * FM-RYO	✓	✗	✗	✗	✗
Product * Quit Motivation	✗	✗	✗	✗	✓
Product * EC use in the past 30 days	✓	✓	✓	✗	✗

✓ p ≤ .05
✗ > .05

Mean estimates of elasticity as moderated by age, factory-made roll-your-own cigarettes, heaviness of smoking index, and use of e-cigarettes in the past 30 days



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CONCLUSIONS

- Smokers valued FMC more than VLNC and EC
- FMC were less sensitive to price increases
- Unless preferences change VLNC and EC will need to be priced lower than FMC to serve as viable substitutes
- Demand was higher for EC among those who have used EC in the past 30 days
- Demand was higher for EC among those who were 25+ years old
- Demand on VLNC was higher for was higher for those more nicotine dependent
- There was lower demand for VLNC and EC relative to FMC. This differential demand was moderated by age, RYO status, nicotine dependence, and EC use

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