

tobacconomics

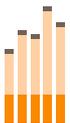
Economic Research Informing Tobacco Control Policy

Prices, Taxes and the Demand for Electronic Nicotine Delivery Systems

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Society for Research on Nicotine and Tobacco - Europe
Prague, Czech Republic, 8 September 2016

Overview

- Demand for E-Cigarettes
 - Effects of prices on e-cigarette demand
 - Cross-price, other effects
- ENDS Taxation – Options
 - Potential e-cigarette tax revenues



Disclosures

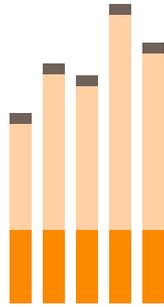
- National Cancer Institute, State and Community Tobacco Control Initiative, 5UO1-CA154248
- Centers for Disease Control and Prevention, Office on Smoking and Health
- American Cancer Society, Cancer Action Network
- Conflicts of Interest – none declared



Collaborators

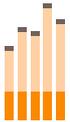
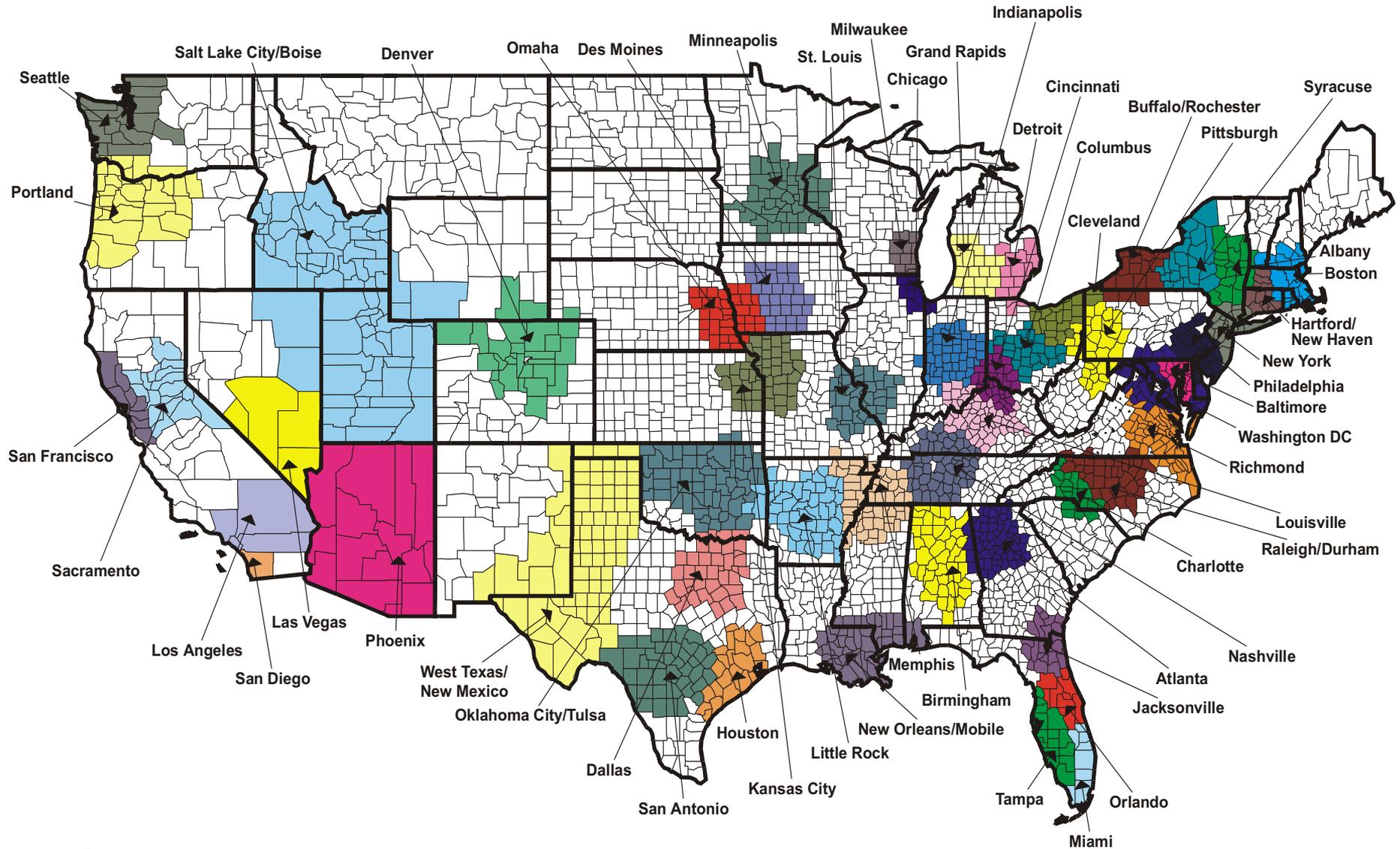
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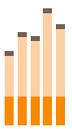
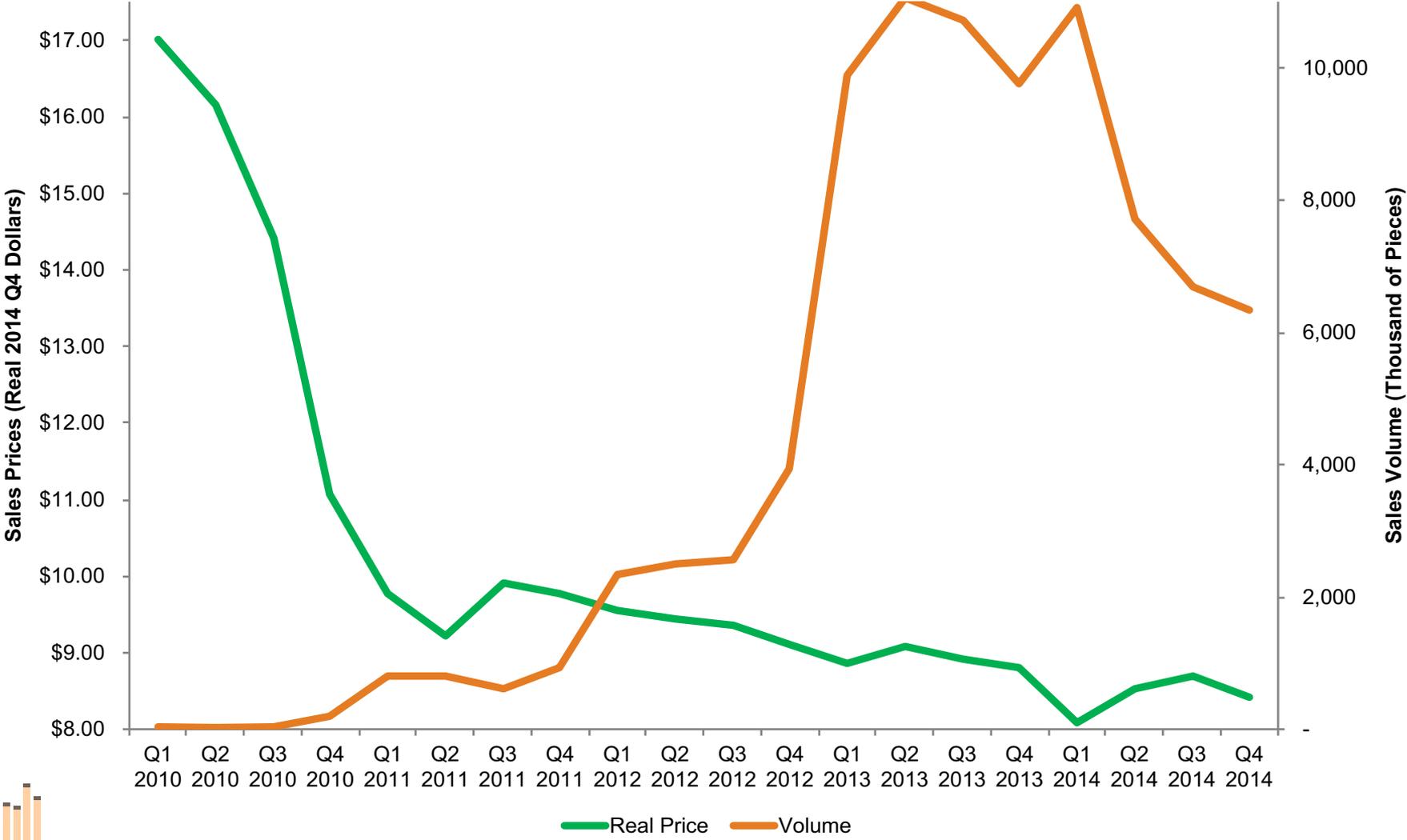
E-Cigarette Demand

Nielsen Store Scanner Data



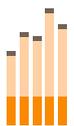
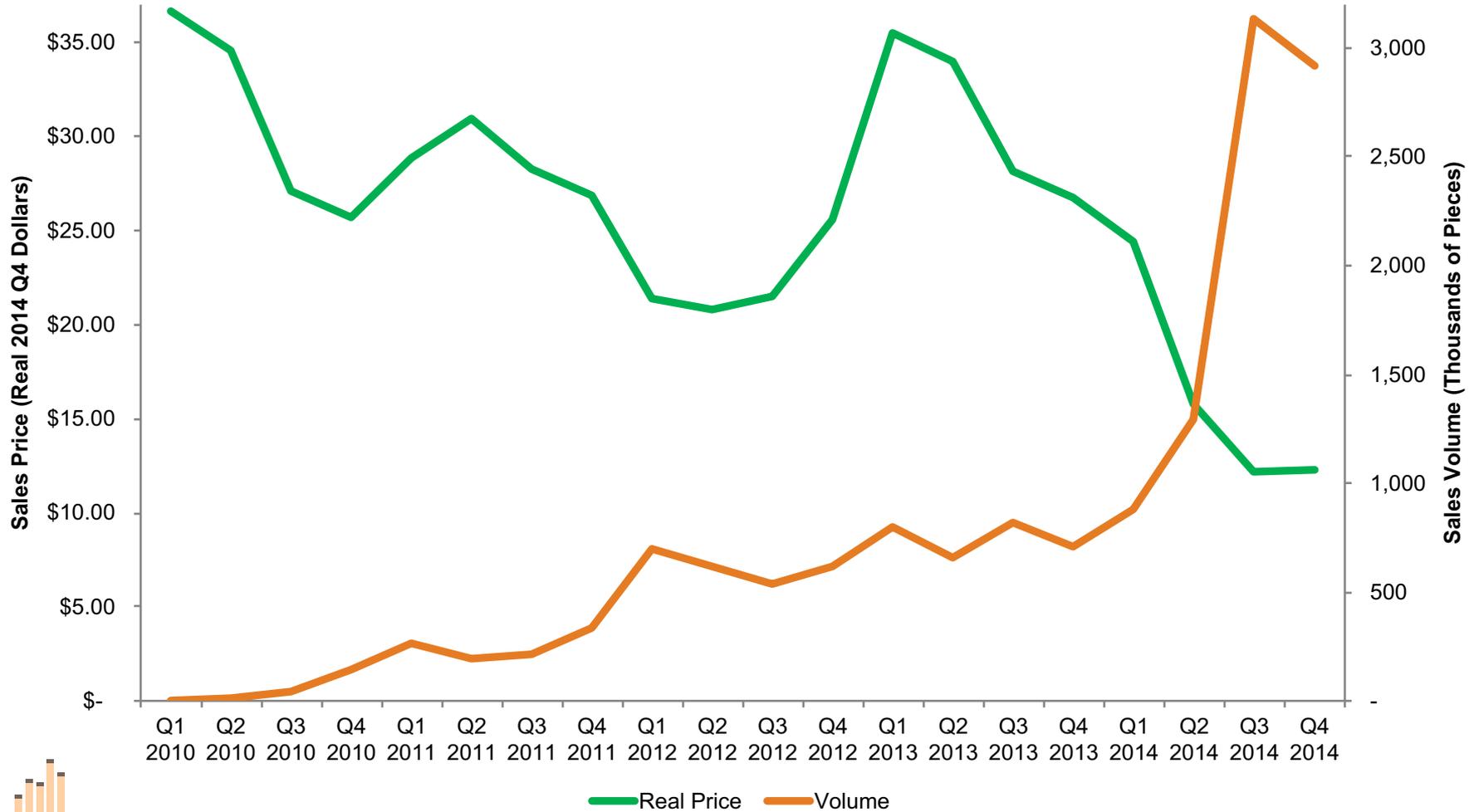
Disposable ENDS

Sales Volume and Price, US 2010 - 2014



Reusable ENDS

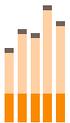
Sale Volume and Price, US 2010 - 2014



— Real Price — Volume

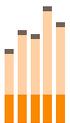
E-Cigarette Prices & Sales

- Huang, et al., *Tobacco Control*, 2014
 - 2010-2012, quarterly e-cigarette sales data
 - Overall sales of e-cigarettes are sensitive to price changes
 - A 10% increase in price reduces sales of disposable e-cigarettes by approximately 12%, and by about 19% for reusable e-cigarettes.
 - Sales of disposable e-cigarettes were higher in markets with stronger smoke-free air policies.
 - No consistent relationship between cigarette prices and e-cigarette sales.
 - Increasing reusable e-cigarette price will lead to an increase in disposable e-cigarette sales.

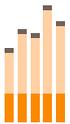
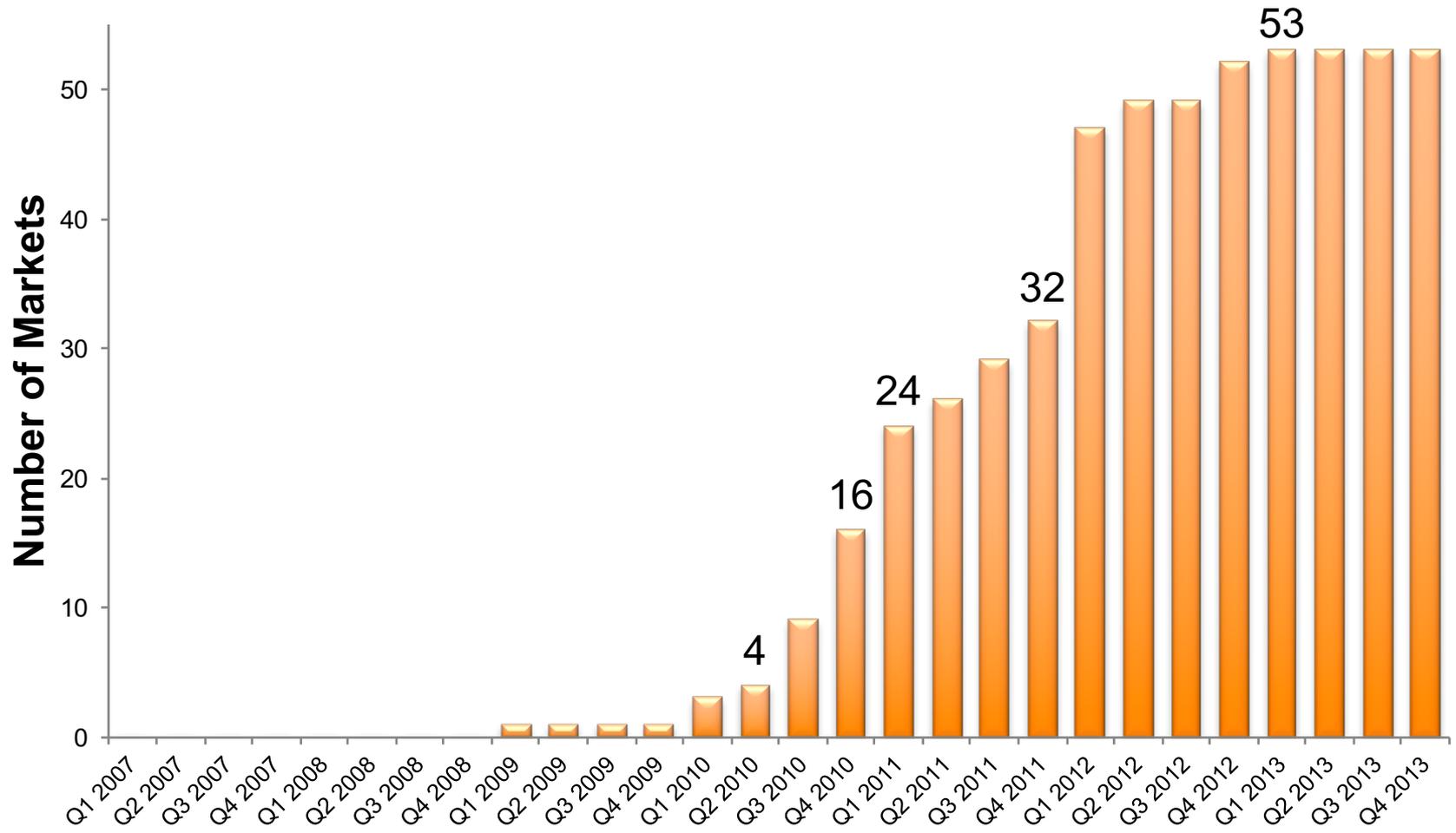


E-Cigarette Prices & Sales

- Gwarnicki, et al. (under review)
 - 2010-2014, quarterly e-cigarette and other nicotine product sales data
 - Overall sales of e-cigarettes are sensitive to price changes
 - 10% increase in price reduces sales of disposable e-cigarettes by between 9% and 16%.
 - 10% increase in price of rechargeable e-cigarettes reduces sales by between 14% and 24%
 - Generally positive associations between cigarette prices and e-cigarette sales, implying substitution from cigarettes to e-cigarettes in response to increases in the relative price of cigarettes

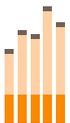


Number of Nielsen Markets with E-cigarette Sales



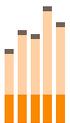
E-Cigarettes and NRT Sales

- Diaz, et al. (in progress)
 - 2009-2014, quarterly e-cigarette and nicotine replacement product sales data
 - Assess the entry of e-cigarettes into Nielsen markets, e-cigarette prices, and e-cigarette sales on sales of NRT products
 - Preliminary findings include:
 - E-cigarette entry associated with reduced sales of NRT patches and gum
 - Greater e-cigarette sales volume generally associated with reduced NRT sales
 - Evidence of substitution based on positive cross-price effects



E-Cigarette Prices & Sales

- Stoklosa, Drope & Chaloupka (2016)
 - 2011-2014 monthly Nielsen data on e-cigarette sales in six EU countries (Estonia, Ireland, Latvia, Lithuania, Sweden, and UK)
 - Own price elasticities range from -0.83 to -0.87: 10% price increase reduces sales by 8-9%
 - E-cigarette sales generally positively associated with cigarette prices, but mostly not statistically significant



Impact of Price on E-cigarette Use

- Huang, et al . (under review)

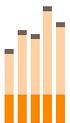
Methods:

- Nationally representative 2013 online survey
 - 7,522 U.S. adults from GfK's Online Knowledge Panel.
- Survey data linked with Nielsen e-cigarette retail prices
 - separately for disposable and reusable e-cigarette
- Weighted survey logistic regression analysis
 - ever use and current use
 - Control for cigarette price, demographics, and socioeconomics

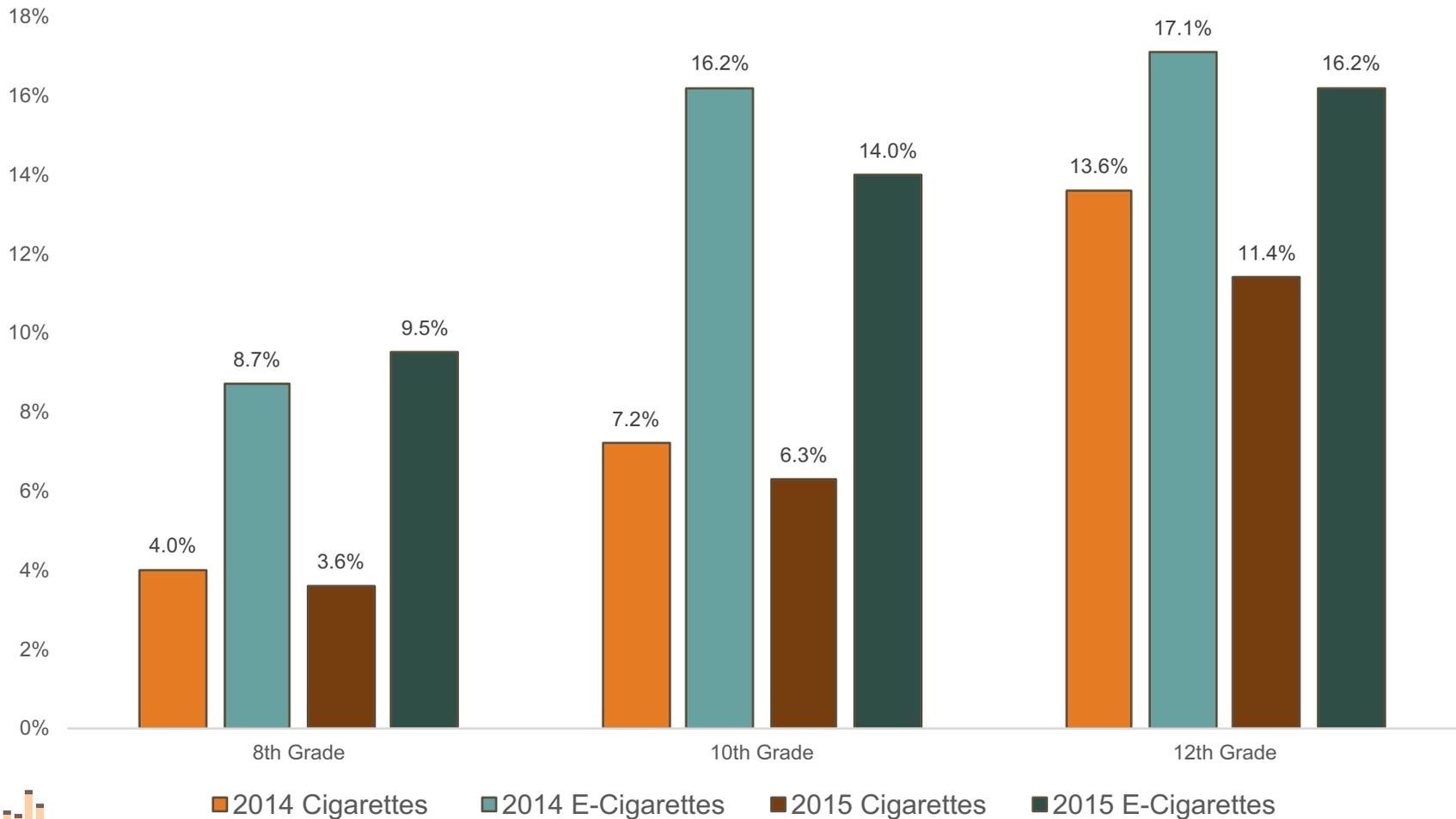


Impact of Price on E-cigarette Use

- Huang, et al. (under review) :
 - Higher disposable e-cigarette prices correlated with lower odds of ever use
 - estimated own price elasticity ranges from -0.81 to -0.98, implying 10% price increase reduces likelihood of trying e-cigs by 8-10%
 - Neither rechargeable e-cigarette price nor combustible cigarette price was found associated with e-cigarette ever use
 - No significant interactions between e-cigarette or cigarette price and e-cigarette current use.



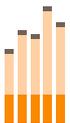
Youth E-Cigarette and Cigarette Use Middle & High School Students, Use in past 30 days, 2014-2015



Impact of Price on E-cigarette Use

Pesko, et al. (in progress):

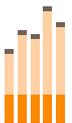
- 2014 & 2015 Monitoring the Future data on youth use of e-cigarettes
- Nielsen scanner price data
- Preliminary estimates:
 - Prevalence elasticity: -0.6 , so 10% price increase reduces likelihood of youth use by 6%
 - Intensity elasticity: -1.0 , implying 10% price increase reduces frequency of use among users by 10%
 - Cigarette price insignificant

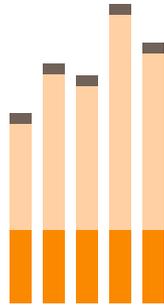


Impact of Price on E-cigarette Use

Research Needs:

- Better measures of the costs of using e-cigarettes:
 - initial fixed costs on devices
 - recurring costs on e-juices
- Better measures of e-cigarette use:
 - frequency, intensity, device type, etc.

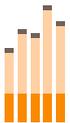




ENDS Taxation

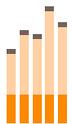
Rationale for ENDS Taxation

- Improve Public Health
 - Encourage switching from combusted to potentially less harmful products
 - Prevent youth initiation
- Raise Revenue
 - Replacement revenue source as revenues from cigarettes and other tobacco products fall



ENDS Taxation in the US

- Minnesota, North Carolina, Louisiana and DC currently tax ENDS
 - 95% of wholesale price in MN; 67% in DC; 40% in PA
 - 5 cents per ml in NC, LA; 7.5 cents/ml in WV; 20 cents/ml in KS
- Local ENDS taxes:
 - Petersburg AK (45% of wholesale price)
 - Mat Su Borough, AK (55% of wholesale price)
 - Chicago (80 cents per unit, plus 55 cents per ML)
- Many others have proposed or are considering



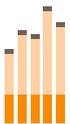
ENDS Taxation Globally

- Togo: 45% of retail price
- Republic of Korea: 1799 won/ml (US\$1.65/ml)
- Italy:
 - Mid-2013: 58.5% of retail price
 - Late-2014: 50% of retail price
 - Early 2015: €3.73 per 10 mls
 - May 2015: eliminated
- Portugal: €0.60/ml
- Others have proposed or are considering
 - European Union proposal to tax like cigarettes



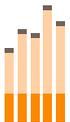
Mechanics of ENDS Taxes

- How to tax?
 - Specific vs. *ad valorem*?
- What to tax?
 - All products/components vs. e-juice?
 - Only products that contain nicotine?
 - All nicotine vs. nicotine derived from tobacco?
- Where to collect tax?
 - Distributor vs. retailer?
 - Need for licensing



ENDS Taxation

- Low tax relative to cigarette, OTP taxes
 - Little impact in reducing use, uptake
 - Encourages dual use
 - Maximize incentives to switch from combustibles to ENDS
 - Minimal new revenue
- ENDS tax equivalent to cigarette tax
 - Significant impact on use, uptake
 - Little incentive to switch from combustibles to ENDS
 - Modest new revenue



Optimizing ENDS Taxation

- Significant tax on ENDS coupled with increased taxes on cigarettes and other combustible tobacco products
 - Maintain or increase relative price of combustibles
 - Maximize switching while discouraging initiation and dual use
 - Generates significant new revenues



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PERSPECTIVE

Differential Taxes for Differential Risks — Toward Reduced Harm from Nicotine-Yielding Products

Frank J. Chaloupka, Ph.D., David Sweanor, J.D., and Kenneth E. Warner, Ph.D.
N Engl J Med 2015; 373:594-597 | August 13, 2015 | DOI: 10.1056/NEJMp1505710



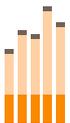
Circulation
JOURNAL OF THE AMERICAN HEART ASSOCIATION

Electronic Cigarettes: A Policy Statement From the American Heart Association
Aruni Bhatnagar, Laurie P. Whitsel, Kurt M. Ribisl, Chris Bullen, Frank Chaloupka, Mariann R. Piano, Rose Marie Robertson, Timothy McAuley, David Goff and Neal Benowitz
on behalf of the American Heart Association Advocacy Coordinating Committee, Council on Cardiovascular and Stroke Nursing, Council on Clinical Cardiology, and Council on Quality of Care and Outcomes Research

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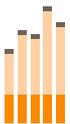
Potential ENDS Tax Revenues

- Assume own-price elasticity of -1.5 based on published Nielsen data analysis
- Assume same elasticity in other market segments
- Calculate new sales and tax revenues
 - CA:
 - 20% tax – revenues around \$18.7 million
 - 40% tax – revenues around \$21.4 million
 - \$1.00 cigarette tax increase (almost 20% price increase) generates nearly \$550 million in new revenue



Summary

- Taxes on disposable and rechargeable e-cigarettes will reduce sales
- Taxes on disposable e-cigarettes likely to reduce e-cigarette ever use (trial use and experimentation)
- Cigarettes and e-cigarettes increasingly appear to be substitutes for one another
- E-cigarettes appear to be substitutes for nicotine replacement products
- ENDS taxes will generate new revenues, but relatively modest (at least in the short term)
- Differential taxes on cigarettes and ENDS have potential to significantly improve public health



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