

would be earned if no price differential existed is examined. The analysis reveals that New York and Illinois are, by a large margin, losing the most yearly tax revenue (nearly \$140M each) to out-of-state cigarettes. Other top ranking revenue-loss states in order include Florida, Washington, Minnesota, Massachusetts, Arizona, and Ohio. On the other end of the spectrum, states gaining the most revenue under the current price regime are in order, Pennsylvania, New Hampshire, Indiana, West Virginia, Delaware, Missouri, Virginia, and Iowa. When all state gains (or losses) are summed, the net is a loss at \$294.6M nationwide. In a second analysis of the fitted model, state-specific consumption estimates are derived under a regime in which a pack of cigarettes always costs the consumer \$10 and in which there is no border price differential. The analysis reveals that the 2014 consumption estimate of approximately 13 billion packs of cigarettes drops to just under 8 billion under the nationwide \$10 per pack regime. Conclusions: The analysis results suggest that state excise tax revenues are unfairly distributed due to tax avoidance or evasion behavior, and the net effect is a nationwide loss of almost \$300 million in state revenues. This is money that could have been spent by high tax states towards their tobacco control goals, but instead went at a discount to states that have a lower excise tax, and likely weaker tobacco control goals. The analysis also revealed that a nationwide minimum price on tobacco could have a very strong effect on cigarette consumption, cutting out over a third of current consumption. These estimates are drawn from a model fitted to real and recent data. Moreover, the nature of the model allows for state specific idiosyncrasies that may affect price and adjacent state price effects to bear on the results, an approach not seen in the literature to date. However, the calculations involve assumptions that may not be realistic. For example, it is not clear that the price effect will remain the same at all price levels (i.e., the price effect may be non-linear). Also, a minimum price on cigarettes would not necessarily remove price differentials as assumed in the 10\$ per pack scenario. Thus, the results of this study are best viewed as somewhat stylized views of what we are losing in the current price regime, and what we could achieve under another.

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Effects of Surgical vs. Non-Surgical Weight Loss on Mammary Tumor Burden

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Background: Obesity is associated with increased incidence of basal-like breast cancer (BLBC), the most aggressive and lethal breast cancer subtype. Epidemiological data is conflicting on whether weight loss offers protection against BLBC in obese women; only interventions that typically result in significant sustained weight loss, such as bariatric surgery, produce a consistent anti-cancer benefit. **Purpose:** We sought to determine the differential effects of surgical and non-surgical weight loss interventions on inflammation, metabolic hormones and tumor burden in a mouse model of pre- menopausal breast

cancer. **Methods:** Mice were fed a low fat control (Con) or high fat diet-induced obesity (DIO) regimen for 15 weeks to model chronic obesity. Obese mice were then randomized to continue the DIO diet (Obese) or receive a surgical or diet weight loss intervention, resulting in formerly obese (FOb)-Surg or FOb-Diet, respectively. FOb-Surg mice were subject to sleeve gastrectomy (~70% of the stomach excised), while FOb-Diet mice received a low fat diet. FOb-Surg and FOb-Diet mice normalized body weight and body fat percentage to levels seen in the Con group. After weights stabilized, all mice were orthotopically injected with E0771 mammary tumor cells, which model BLBC. **Results:** At study endpoint, the average tumor weight in FOb-Surg mice was statistically equivalent to Con mice that maintained a healthy weight throughout study. However, the average tumor weight in FOb-Diet mice was statistically equivalent to Obese mice, both groups significantly greater than Con mice. Additionally, FOb-Surg had statistically lower serum insulin and interleukin-6 compared to FOb-Diet and Obese mice, suggesting that the sleeve gastrectomy more effectively reduced obesity-associated inflammation. **Conclusion:** Our results suggest that the anti-cancer benefit seen with bariatric surgery may be related to a significant reduction in systemic inflammation and growth factor signaling, which did not occur with non-surgical weight loss despite an equivalent amount of weight and body fat loss in FOb-Diet mice. Identifying the mechanisms underlying the protective effects of bariatric surgery against breast cancer could help identify new targets and strategies for breaking the obesity-cancer link.

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Childhood Socioeconomic Position and Pubertal Onset: Implications for Breast Cancer

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Higher socioeconomic position (SEP) has been associated with increased risk of breast cancer. Its relationship with the age of menarche, which is inversely associated with risk of breast cancer, and to the age of pubertal onset, is less clear. We studied the relationship of SEP to pubertal onset in a multiethnic cohort of girls aged 6–8 years at baseline and followed for 5–8 years in the Breast Cancer and the Environment Research Program in three study sites across the United States that included annual clinical examinations performed from 2004 to 2012. Analyses were conducted with accelerated failure time models using a Weibull distribution, with left, right and interval censoring. Among 1059 girls, an index of SEP comprised of household family income, mother's education and whether the home was owned or rented was assessed for associations with pubertal onset, measured by breast budding (Tanner Stage B2) and pubic hair development (Tanner Stage PH2). Girl's BMI% at entry to the study and black or Hispanic race/ethnicity were the strongest predictors of age at pubertal onset by both measurements, but the SEP index was an independent predictor in adjusted models. Girls from the lowest quintile of SEP entered puberty on average 6% earlier (6.0–7.5

months) than girls from the highest quintile (time ratio = 0.94, 95% confidence interval 0.91–0.97) adjusted for BMI%, race/ethnicity and their interaction. The meaning of SEP in this relationship bears further study, but our results suggest that early life social circumstances beyond race/ethnicity and body size may influence the timing of pubertal development.

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E-Cigarette Marketing Online: A Systematic Content Analysis of Manufacturers and Retailers

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Purpose: To identify the current atmosphere of online sales of Electronic Nicotine Delivery Systems (ENDS) in regards to key health-related and legal claims being made and to analyze the legal framework for regulating such claims. **Methods:** In December 2014, a systematic search protocol was employed with 3 popular search engines using six terms: 1) e-cigarettes, 2) e-cigs, 3) e-juice, 4) e-liquid, 5) e-hookah, and 6) vape pen. Websites from ENDS manufacturers and retailers were eligible for inclusion, and excluded review sites, blogs, or other non-commercial sites. Three pages of content were examined for each search term.

In Phase I, included sites were independently coded for several health-related and legal themes, including: Modified or Reduced Risk, Cessation, Smoke anywhere, Health Benefits, Cleanliness, Environmentally Friendly, and Modern. In Phase II, gathered qualitative data was further coded for primary (explicit) and secondary (implicit) claims. **Results:** The final web search ($n = 115$) identified eligible sites and these were divided into two categories Manufacturers ($n = 78$) and Retailers ($n = 32$). Between both groups, the most common claims were Modified or reduced risk claims (63.6%), Cessation claims (41.8%), and Claims regarding one's ability to get around clean indoor air laws (42.7%) for Manufacturers and Retailers, combined. Overall, Manufacturers were more likely to make any health or legal claim than Retailers. **Conclusions:** The unregulated marketing of ENDS has led to a proliferation of health-related claims. Applying a legal/regulatory perspective, this research reveals the different types of health-related claims being made by ENDS manufacturers and retailers on their websites. For claims that are misleading or deceptive, the specifics content and context of each claim may influence whether the FDA has the current regulatory authority to address it. This research demonstrates that the FDA should complete the proposed "deeming" rule and develop a comprehensive regulatory scheme to address health-related claims by ENDS manufacturers and retailers.

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