DO THE BENEFITS OF CALIFORNIA’S PROPOSITION 65 LAW OUTWEIGH ITS COSTS?

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Disclosures: Presentation draws partially on work based on funded studies.


(2) Affiliated Senior Scholar at the Mercatus Center at George Mason University, 2011-16. Papers on cost-benefit analysis of public health regulations. Topics include nudging, taxation, FDA, electronic health records, nutritional advice, obesity policy.

Prop 65: Introduction

• voter-approved (64%) Safe Drinking Water & Toxic Enforcement Act of 1986

• “right-to-know”: businesses notify about toxic chemicals in products

• "clear and reasonable" warnings on products carrying “lifetime” cancer risk or reproductive harm
  
  (1 in 100,000 chance of any person exposed to product contracting cancer over 70 years)

labels, signs, notices, or newspapers

> 800 listed chemicals, including pesticides, heavy metals, Vitamin A at certain levels

**WARNING**

This Product May Contain A Chemical Known To The State Of California To Cause Cancer, Or Birth Defects Or Other Reproductive Harm.

ILSI Annual Meeting 2017
**Enforcement** (not by government agency)
- California attorney general via enforcement action
- district/city attorney (cities > 750,000 people)
- party acting in public interest may file lawsuit against businesses

**Penalties**
- up to $2,500 per day for each violation
- party in public interest first sends alleged violation notice 60 days before filing suit
- 582 settlements in 2015, = $26,226,761 (68% went to attorneys fees)
Right-to-Know Law Rationales

Conventional View

• markets penalize sellers that hide negative product attributes
  (evidence: lawsuits, stock price reactions to product recalls)
• but markets are imperfect, under-provide information
  (firm conducting research absorb costs, others “free-ride”)
• labels inform utility-maximizing rational consumers

Behavioral Economics View

• people often irrational & make harmful decisions (over-eating, smoking…)
  (due to self-control problems & cognitive biases)
• many decisions unconscious (e.g., “mindless eating”)
• informational “nudges” steer “mindless” toward “mindful” choices

“nudge” theorists place much blame on businesses
“The key point here is that for all their virtues, markets often give companies a strong incentive to cater to (and profit from) human frailties, rather than to try to eradicate them or to minimize their effects.”

Mandated disclosure nudge goals
1. promote “sunlight” on problems spurs consumers/producers to take actions
2. provide information citizens can easily find and use
3. improve government decisions via input from consumers/producers prior to approval (provides checks on mistaken regulations)

Nutrition Labeling and Education Act of 1990 required “nutrition fact panels” on most packaged foods.
STATE OF CALIFORNIA SAFETY WARNING: Drinking beverages with added sugar(s) contributes to obesity, diabetes, and tooth decay.

Safe Handling Instructions
This product was prepared from inspected and passed meat and/or poultry. Some food products may contain bacteria that could cause illness if the product is mishandled or cooked improperly. For your protection, follow these safe handling instructions.

- Keep refrigerated or frozen.
- Thaw in refrigerator or microwave.
- Keep raw meat and poultry separate from other foods.
- Wash working surfaces (including cutting boards), utensils, and hands after touching raw meat or poultry.
- Cook thoroughly.
- Keep hot foods hot. Refrigerate leftovers immediately or discard.
Warnings Effective? A Probability Model

Nudging health gains through labels deceptively simple when using four-step process.

Step A - Consumers will read labels
Step B - Consumers will understand labels
Step C - Consumers will make improvements in their choices
Step D - Consumers will experience improved health

Let event A = read labels, B = understand labels, C = make healthier decisions, D = are healthier.

Model the four steps using the chain rule from the following joint probability:

\[ P(A \cap B \cap C \cap D) = P(A) \times P(B|A) \times P(C|A, B) \times P(D|A, B, C) \]

where,

\[ P(A \cap B \cap C \cap D) = \text{joint probability of all four events} \]
\[ P(A) = \% \text{ of people who read labels}, \]
\[ P(B|A) = \% \text{ of people understand labels after reading them} \]
\[ P(C|A, B) = \% \text{ people healthier decisions after reading & understanding labels} \]
\[ P(D|A, B, C) = \% \text{ people w/improved health after reading/understanding labels, and make healthier decisions} \]

\( \cap = \text{joint} \)
Simulations: Joint probability of successfully nudging improved health

“Optimistic” assumes each step has 50% probability.

\[ P(A) = 50\% \]
\[ P(B \mid A) = 50\% \]
\[ P(C \mid A, B) = 50\% \]
\[ P(D \mid A, B, C) = 50\% \]

\[ P(A \cap B \cap C \cap D) = 0.50 \times 0.50 \times 0.50 \times 0.50 = 0.0625 = 6.25\% \]

“Less optimistic” assumes each step has 10% probability.

\[ P(A) = 10\% \]
\[ P(B \mid A) = 10\% \]
\[ P(C \mid A, B) = 10\% \]
\[ P(D \mid A, B, C) = 10\% \]

\[ P(A \cap B \cap C \cap D) = 0.10 \times 0.10 \times 0.10 \times 0.10 = 0.0001 = 0.01\% \]

Greater are each probability, higher the probability mandated labels improve health.
Step 1: a percentage of consumers notice labels.

Warnings for a typical California hotel include: mercury in seafood; secondhand tobacco smoke; cleaning supplies and related activities; on-site construction; furnishings, hardware, and electrical components, including furniture, window treatment, locks, keys, electrical equipment, and carpeting; personal hygiene and medical supplies, including soaps, shampoos, and first aid supplies; hotel water supply systems, from faucets and other plumbing components; combustion sources, including automobile engines, gas stoves, fireplaces, and candles; office and art supplies and equipment, including carbonless paper, marking pens, copier machine chemicals, glues, crayons, and paints; landscaping supplies and pesticide treatment, including fertilizers, soil amendments, and pesticides; food and beverage service, and broiled and barbecued foods; transportation-related exposures, including motor fuels and engine exhaust; equipment and facility maintenance, including motor oil changes, carburetor cleaning, battery replacement, and facility repairs; retail sales; and recreation facilities, swimming pools, hot tubs and beaches, including beach sand (which can contain quartz)…

Research on Nutrition Labels

- grabbing consumer attention requires informing on attributes they care about
- 65% in 1990s used food labels, dropped to 48 % in 2013
- research suggests self-reported use over-stated
- nudges inform about calories/fat…, but taste dominates purchase decisions

Prop 65: ubiquitous nature of warnings fosters little notice over time

- over-warn to protect from lawsuits or bad publicity
  even minute amounts of listed chemicals; reinforces consumer inattention

Step 2: a percentage of consumers reading labels understand them

- consumers struggle to interpret food labels (often overwhelmed)
- 52% doing taxes easier than knowing what is “healthy” eating
- calorie labeling makes consumers better able to estimate calories

- 90% give some thought to food ingredients, but taste (87%) dominated choices, followed by price, “healthfulness”
- 64% consumers used serving size (SS) info in 2008, but ½ misunderstood meaning

- consumers overestimate small-probability & underestimate larger risks (1980s Tylenol tampering incident (cyanide) devastated sales, low-probability risk)

Cowburn and Stockley. "Consumer understanding and use of nutrition labelling: a systematic review." Public health nutrition 8, no. 01 (2005).
Prop 65: inform product has chemical that might cause cancer /affect reproduction

No information on:

• what the substance is
• where it is in the product
• how consumer might be exposed
• what level of risk is
• or how to reduce exposure

Revision of 1986 law

Aug 30, 2018: safe harbor warning must identify at least one listed chemical by name contained in product and “For more information go to www.P65Warnings.ca.gov.”

“Waiting for Godot”
Step 3: a % of consumers reading & understanding labels make healthier choices.

- nutrition fact panel had no effect on total fat, saturated fat, or cholesterol
- NYCs 2008 law requiring restaurants to post calories didn’t alter calories
- similar result for menu-labeling regulation in King County, Washington
- mandatory calorie posting at Starbucks virtually no effect on beverage calories
- calorie labeling had no effect on lunch at large chain bakery café

Prop 65

So, little evidence third stage of probability framework meets much potential to help people make changes that lower their risk of cancer or reproductive harm.

Rendell et al. "Point-of-purchase calorie labeling has little influence on calories ordered regardless of body mass index." Current obesity reports (2014).
Step 4: a percentage of consumers who read & understand labels, who then alter purchases, experience improved health.

- studies focus on altering consumption of targeted item (fast food, soda, …)
- substitutions rarely accounted for
  (host of unintended effects)
- effects on disease, weight or other health measures rarely considered
  (presumption: labels somehow translate into improved health)

assessing performance of interventions needs major redirection
Does Proposition 65 Promote Public Health?

• cancer rates fell relative to other states?
• Surveillance, Epidemiology, and End Results (SEER) Program of NCI population-based cancer registries covering 28% of U.S. population
• SEER 9 registries: longest data set for cases diagnosed from 1973 - Atlanta, Detroit, SF–Oakland, Seattle–Puget Sound
• cancer incidence rate = number of new cancers occurring in a specified population during a year (# per 100,000 people at-risk, age-adjusted rates)

Marlow, Michael L. "Too Much (Questionable Information); Do the Benefits of California's Proposition 65 Carcinogen Right to Know Law Outweigh Its Costs." Regulation 36 (2013).
Lagged effects from Prop 65

latency periods associated with toxic chemicals influenced by

- amount/frequency of exposure
- age, genetics, lifestyle… (independent of “right-to-know” law)
- environmental substances exposure assoc. w/ 2–15% of all cancers

Empirical strategy

(1) lags of 10–19 years to mitigate “cherry-picking” concerns
- shortest lag starts in 1996, longest starts in 2005
- locate a consistent chain of statistically significant effects

(2) examine incidence gap w/ SF to control for factors affecting incidence across nation
- (lifestyle, health care, cancer detection, air & water pollution, …)

(3) Prop65 = dichotomous variable
- + (-) coeff indicates larger (smaller) gap consistent (inconsistent) w/ lowering incidence in CA
Table 1: Both Sexes, All Race SEER 9 Data, 1974-2009.
Dependent Variable: Atlanta-SF
Number of observations = 34.
Mean Dependent Variable = -14.02.

<table>
<thead>
<tr>
<th>Year</th>
<th>Constant</th>
<th>Prop65</th>
<th>AR(1)</th>
<th>Adj. R²</th>
<th>F-Stat</th>
<th>DW</th>
<th>Q, lag = 2</th>
<th>Q, lag = 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996</td>
<td>-4.82 (.77)</td>
<td>-0.84 (.95)</td>
<td>.84 (&lt;.001)</td>
<td>.73</td>
<td>44.87 (&lt;.001)</td>
<td>1.98</td>
<td>0.11 (.74)</td>
<td>.19 (.91)</td>
</tr>
<tr>
<td>1997</td>
<td>-17.21 (.09)</td>
<td>17.58 (.11)</td>
<td>.75 (&lt;.001)</td>
<td>.75</td>
<td>49.27 (&lt;.001)</td>
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<td>0.67 (.41)</td>
<td>0.73 (.69)</td>
</tr>
<tr>
<td>1998</td>
<td>10.54 (.70)</td>
<td>-15.82 (.20)</td>
<td>.90 (&lt;.001)</td>
<td>.74</td>
<td>47.53 (&lt;.001)</td>
<td>2.01</td>
<td>0.05 (.82)</td>
<td>0.38 (.83)</td>
</tr>
<tr>
<td>1999</td>
<td>-7.40 (.59)</td>
<td>2.55 (.82)</td>
<td>.82 (&lt;.001)</td>
<td>.73</td>
<td>44.94 (&lt;.001)</td>
<td>1.98</td>
<td>0.08 (.77)</td>
<td>0.19 (.91)</td>
</tr>
<tr>
<td>2000</td>
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<td>23.46 (.02)</td>
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<td>.77</td>
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<td>0.15 (.70)</td>
<td>0.17 (.92)</td>
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<td>2001</td>
<td>-10.16 (.41)</td>
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<tr>
<td>2002</td>
<td>-8.57 (.51)</td>
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<td>.81 (&lt;.001)</td>
<td>.73</td>
<td>45.28 (&lt;.001)</td>
<td>1.96</td>
<td>0.14 (.70)</td>
<td>0.29 (.87)</td>
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<tr>
<td>2003</td>
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<td>.09 (.99)</td>
<td>.83 (&lt;.001)</td>
<td>.73</td>
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<td>1.98</td>
<td>0.08 (.78)</td>
<td>0.16 (.92)</td>
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<td>2004</td>
<td>-6.67 (.62)</td>
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<td>.73</td>
<td>44.95 (&lt;.001)</td>
<td>1.98</td>
<td>0.04 (.84)</td>
<td>0.11 (.95)</td>
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<tr>
<td>2005</td>
<td>-4.76 (.74)</td>
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<td>.83 (&lt;.001)</td>
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<td>44.92 (&lt;.001)</td>
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<td>0.09 (.77)</td>
<td>0.17 (.92)</td>
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Table 2: Both Sexes, All Race SEER 9 Data, 1974-2009.

Dependent Variable: Detroit-SF

Number of observations = 36.
Mean Dependent Variable = 38.38.

<table>
<thead>
<tr>
<th>Year</th>
<th>Constant</th>
<th>Prop65</th>
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<th>Adj. R²</th>
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<th>Q, lag =3</th>
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<td>.94</td>
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<td>2.31 (.13)</td>
<td>3.93 (.14)</td>
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<tr>
<td>1997</td>
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<td>22.07 (.03)</td>
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<td>.94</td>
<td>282.99 (&lt;.001)</td>
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<td>1.98 (.16)</td>
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<td>1998</td>
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<td>.93</td>
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<td>.93</td>
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<td>2.17</td>
<td>1.20 (.27)</td>
<td>3.66 (.16)</td>
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<td>2001</td>
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<td>1.55 (.21)</td>
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<td>3.05 (.22)</td>
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<td>243.59 (&lt;.001)</td>
<td>1.67</td>
<td>1.20 (.27)</td>
<td>2.99 (.22)</td>
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Table 3: Both Sexes, All Race SEER 9 Data, 1974-2009.

**Dependent Variable:** Seattle-SF

**Number of observations = 36.**

**Mean Dependent Variable = -52.01.**

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<td>1996</td>
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<td>.89</td>
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<td>1.90 (.39)</td>
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<td>2000</td>
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<td>-5.13 (.61)</td>
<td>.96 (&lt;.001)</td>
<td>.88</td>
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<td>2.20</td>
<td>.073 (.39)</td>
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<td>62.74 (.38)</td>
<td>0.29 (.97)</td>
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<td>2.24</td>
<td>1.01 (.32)</td>
<td>1.41 (.49)</td>
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<td>2005</td>
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<td>126.90 (&lt;.001)</td>
<td>2.18</td>
<td>0.58 (.45)</td>
<td>0.88 (.64)</td>
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</tbody>
</table>
Summary of Empirical Tests

• casual inspection of trends indicate cancer incidence rates of all sexes were similar even though only SF had Prop 65

• little evidence Prop 65 exerted a positive & statistically significant effect on cancer incidence gaps between 3 locations & SF for all sexes, males or females

• few isolated significant \( p = .02-.04 \) effects on cancer incidence effects vanish with slight changes in lag lengths

\[ P(A \cap B \cap C \cap D) = \text{joint probability of all four events} = ??? \]
Costs of Proposition 65
complex, no one strategy works for all businesses
owners may post warnings, stop production, reformulate or ignore law
research, legal costs, and tastes for risk involved

Businesses predict customer reactions to alternative actions
• warnings weaken demand unless firms predict consumers ignore signage
• reformulation weakens demand when adverse changes in taste, price, coloring, ...
• firms may withdraw products from markets

Ignoring Prop 65 can be costly
lawsuits damage reputation, weaken demand, result in legal costs & penalties
Opportunistic Plaintiff Lawyers

- collect portion civil penalties of up $2,500 per day for each violation

- 582 settlements in 2015, = $26,226,761 (68% to attorneys)
  663 settlements in 2014, = $29,482,280 (71% to attorneys)
  352 settlements in 2013, = $17,409,756 (73% to attorneys)
  437 settlements in 2012, = $22,560,022 (69% to attorneys)
  338 settlements in 2011, = $16,286,728 (73% to attorneys)

- payments are “profits” w/o costs from litigation
  (plaintiffs often entitled to cost reimbursement of bringing lawsuit)

- law burdens businesses to prove chemical exposures do not exceed law
  (expert witnesses make for costly case-by-case litigation)

https://oag.ca.gov/prop65
Prop 65 imposes costs on many citizens

• “hidden” costs difficult to quantify
  no “one-size-fits-all” strategy for dealing with law
• taxpayers pick up administrative costs & uncompensated court costs
• California governments receives little of settlement costs

• businesses bear testing and labeling costs
• businesses lose sales from unhappy consumers, reformulated products, withdrawn products, bad publicity

• consumers bear price hikes

• workers suffer lower income or job insecurity

• governments receive less tax revenue from lost sales and fewer jobs
**Conclusion**

- Costs without public health benefits are characteristics of very bad public policy.

**Probability model demonstrates fanciful nature of Prop 65**

- “heroic” policymaking of experimenting on citizens
  but, “unheroic” since little to no attempt to determine effectiveness

- probability model offers scientific framework for modeling effects that can foster
  “valiant” policies that improve public health

**Public Health Suffers**

if Prop 65 lessens efforts of informing public of how to reduce exposures to
established risk factors for cancer and reproductive harm
**Reforms**

1. change burden of proof so plaintiffs incur costs of proving exposures (decrease number of low-merit & frivolous lawsuits)

2. help citizens re-focus on high-probability risks
   re-design labels to roughly assess true risk
   warning of a 0.001% (1/100,000) chance of contracting cancer over 70 years,
   renders warnings of actual threats to their health unhelpful
   (cancer risk of smoking is over 10,000 greater than this risk level)

3. retrospective review of law (Prop 65 is over 30 years old)
   has it accomplished its goals?
   reforms?
   Concern: “ramped up” interventions following failures of misplaced policies