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

Michael L. Marlow, Professor of Economics, Cal Poly - San Luis Obispo

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

(1) Affiliated Scholar of the Center for the Study of Economic Liberty at Arizona State University, 2016- . Grant to write *"Nutritional Label Nudges Are Unlikely to Improve Public Health,"* working paper, January 2017.

(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.

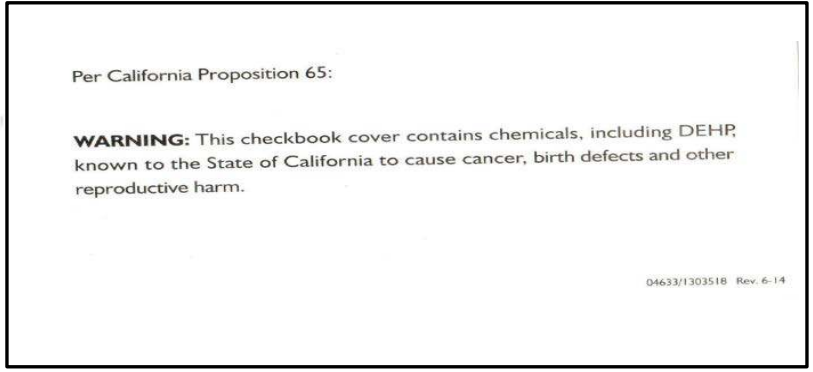
(3) Economic Consultant, American Beverage Association, 2012-13. Project resulted in Marlow, Michael L. *"Too Much (Questionable Information); Do the Benefits of California's Proposition 65 Carcinogen Right to Know Law Outweigh Its Costs." Regulation 36 (2013).*

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



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***

Dan Ariely, Predictably Irrational (New York: Harper Collins, 2009)
Daniel Kahneman, Thinking, Fast and Slow (New York: Farrar, Straus and Giroux, 2011).

"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."

Thaler & Sunstein, Nudge: Improving Decisions about Health, Wealth, and Happiness, 2008.

Mandated disclosure nudge goals

(Sunstein, Cass R. *Simpler: The future of government*. Simon and Schuster, 2014.)

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.

Nutrition Facts

Serving Size 2/3 cup (55g)
Servings Per Container About 8

Amount Per Serving

Calories 230	Calories from Fat 40
	% Daily Value*
Total Fat 8g	**12%**
Saturated Fat 1g	**5%**
Trans Fat 0g	
Cholesterol 0mg	**0%**
Sodium 160mg	**7%**
Total Carbohydrate 37g	**12%**
Dietary Fiber 4g	**16%**
Sugars 1g	
Protein 3g	
Vitamin A	10%
Vitamin C	8%
Calcium	20%
Iron	45%

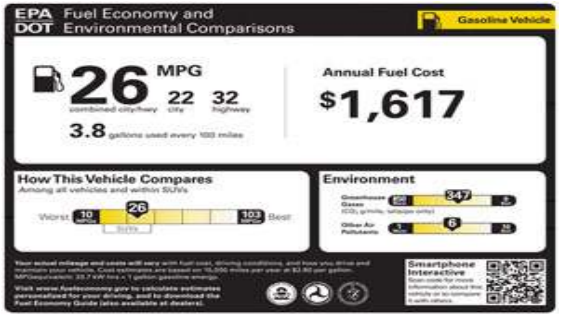
* Percent Daily Values are based on a 2,000 calorie diet. Your daily value may be higher or lower depending on your calorie needs.

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

STATE OF CALIFORNIA SAFETY WARNING:
Drinking beverages with added sugar(s) contributes to obesity, diabetes, and tooth decay.

CONTAIN GMOs

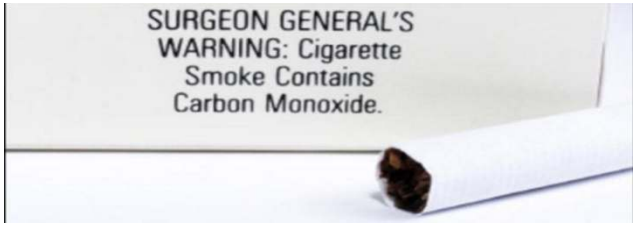
COOL
Country of Origin Labeling



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:

$$P(A \cap B \cap C \cap D) = P(A) * P(B|A) * P(C|A,B) * P(D|A,B,C)$$

where,

$P(A \cap B \cap C \cap D)$ = ***joint probability of all four events***

$P(A) = \%$ ***of people who read labels,***

$P(B|A) = \%$ ***of people understand labels after reading them***

$P(C|A,B) = \%$ ***people healthier decisions after reading*** & ***understanding labels***

$P(D|A,B,C)$
$= \%$ ***people w/improved health after reading***
/understanding labels, and make healthier decisions

$\cap$ = ***joint***

Simulations: Joint probability of successfully nudging improved health

"Optimistic" assumes each step has 50% probability.

$$P(A) = 50\%$$
$$P(B \mid A) = 50\%$$
$$P(C \mid A, B) = 50\%$$
$$P(D \mid A, B, C) = 50\%$$
$$P(A \cap B \cap C \cap D) = 0.50 * 0.50 * 0.50 * 0.50 = .0625 = 6.25\%$$

"Less optimistic" assumes each step has 10 % probability.

$$P(A) = 10\%$$
$$P(B \mid A) = 10\%$$
$$P(C \mid A, B) = 10\%$$
$$P(D \mid A, B, C) = 10\%$$
$$P(A \cap B \cap C \cap D) = 0.10 * 0.10 * 0.10 * 0.10 = .0001 = 0.01\%$$

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

Hennessy, Maggie, "How Much Do Consumers Use (and Understand) Nutrition Labels?," *Food Navigator* (March 2014).

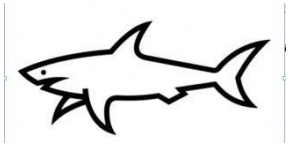
Step 2: a percentage of consumers reading labels understand them

- *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*

IRS
Department of the Treasury
Internal Revenue Service

- *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)



Campos, Doxey, Hammond. "Nutrition labels on pre-packaged foods: a systematic review." Public health nutrition 14, no. 08 (2011).
Cowburn and Stockley. "Consumer understanding and use of nutrition labelling: a systematic review." Public health nutrition 8, no. 01 (2005).
Elbel, et al. "Calorie labeling and food choices: a first look at the effects on low-income people in New York City." Health affairs (2009): w1110-w1121.
Grunert and Wills. "A review of European research on consumer response to nutrition information on food labels." Journal of Public Health (2007).
Jania. "Americans Find Doing Their Own Taxes Simpler Than Improving Diet and Health," Food Insight, International Food Information Council Fdn, 2014.
Zhang et al. "Usage and Understanding of Serving Size Information on Food Labels in the United States." American Journal of Health Promotion , 2016.

***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.

Variyam, "Do nutrition labels improve dietary outcomes?." Health Economics 17, no. 6 (2008): 695-708.
Elbel, et al. "Calorie labeling and food choices: a first look at the effects on low-income people in New York City." Health affairs (2009): w1110-w1121.
Finkelstein et al. "Mandatory menu labeling in one fast-food chain in King County, Washington." American journal of preventive medicine (2011).
Bollinger et al. "Calorie posting in chain restaurants." American Economic Journal: Economic Policy 3, no. 1 (2011): 91-128.
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?

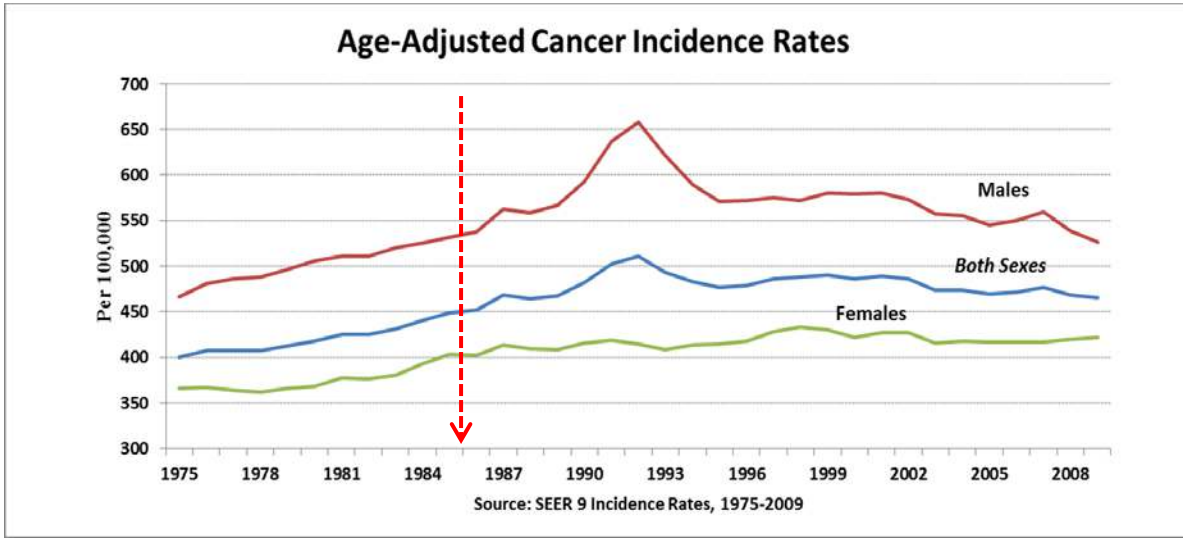
- ***cancer rates fell relative to other states?***
- ***Surveillance, Epidemiology, and End Results (SEER) Program of NCI population-based cancer registries covering 28% of U.S. population***
- ***SEER 9 registries: longest data set for cases diagnosed from 1973 - Atlanta, Detroit, SF–Oakland, Seattle–Puget 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).
Marlow, Michael L., "Caution: This Warning May Be Useless. A 'right to know' law in California hasn't helped consumers, but it's a big burden on business," Wall Street Journal Jan. 20, 2014.
Marlow, Michael L., "After 3 decades, Prop. 65 needs overhaul," Orange County Register, May 5, 2014.

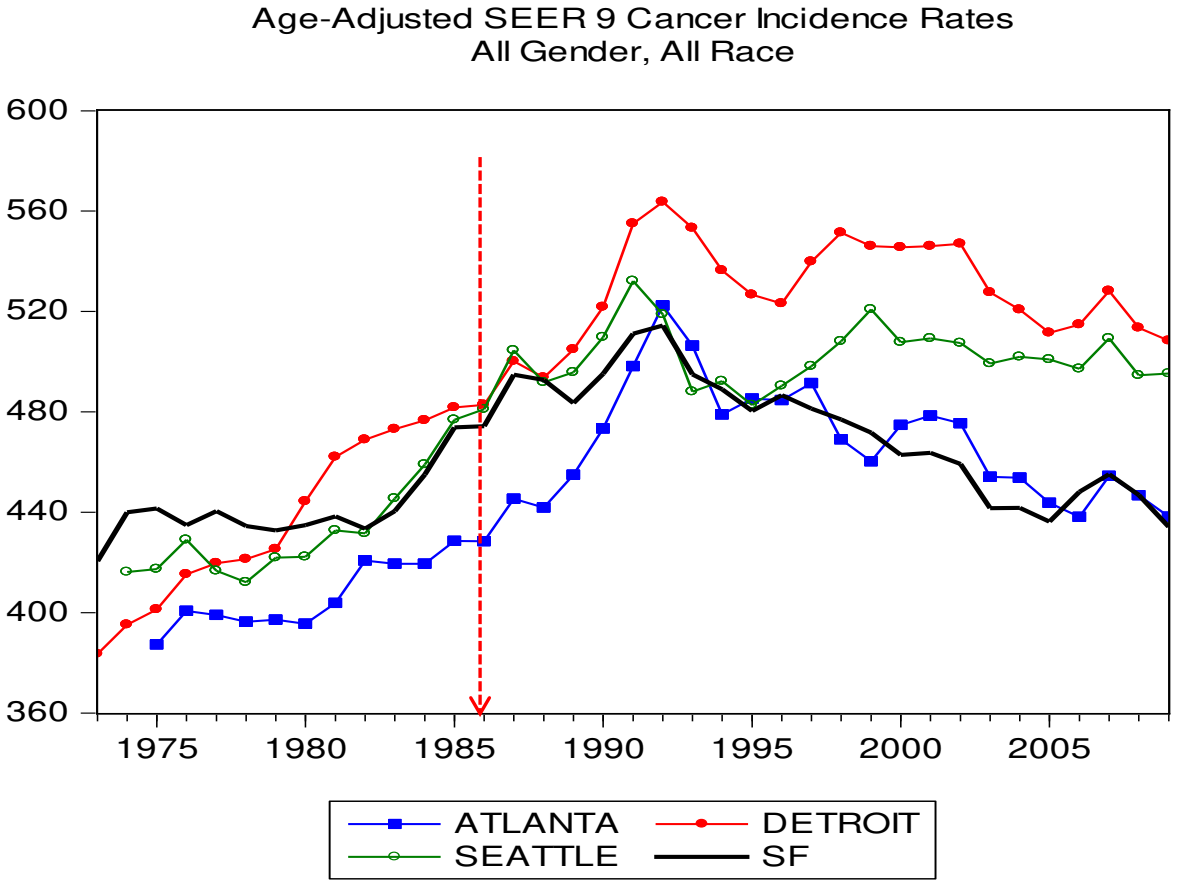
Lagged effects from Prop 65

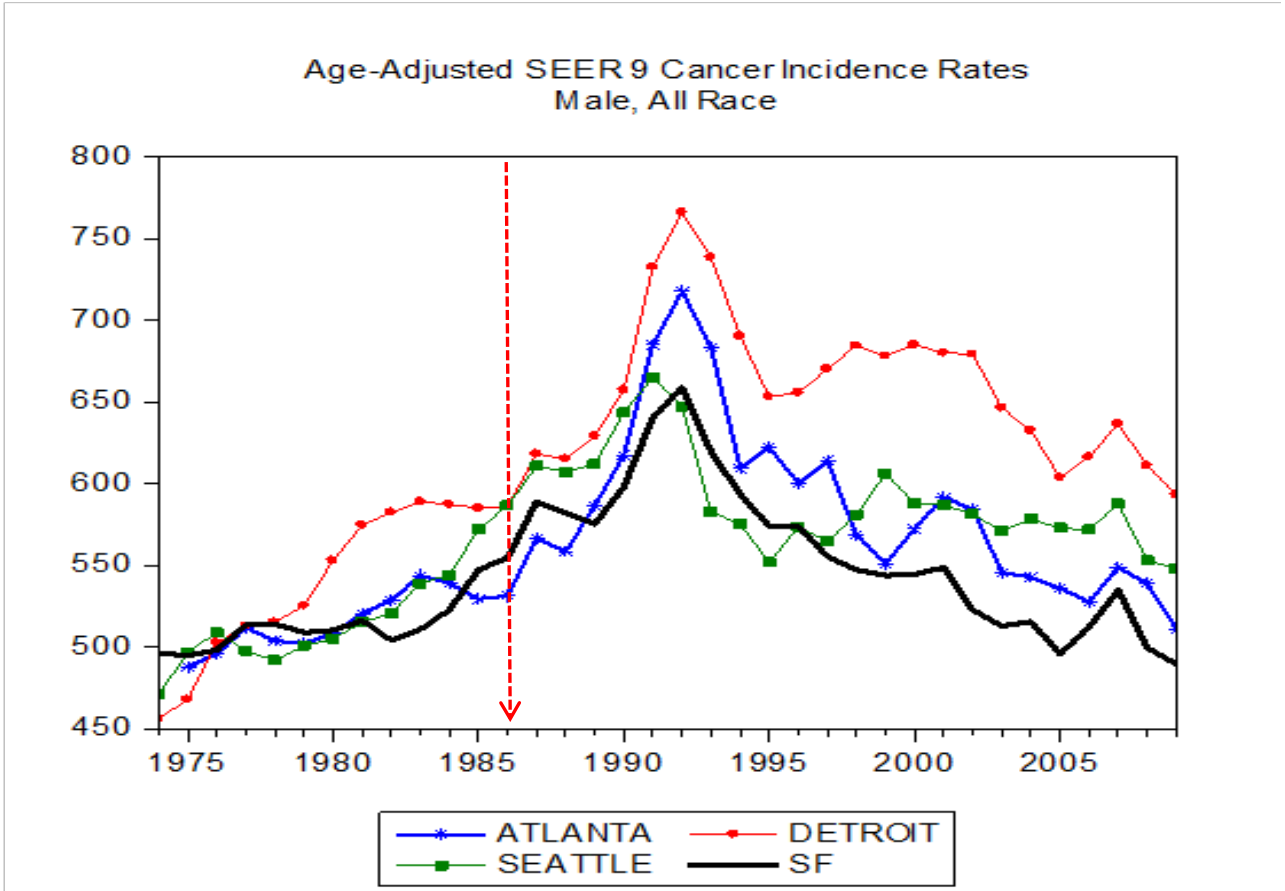
latency periods associated with toxic chemicals influenced by

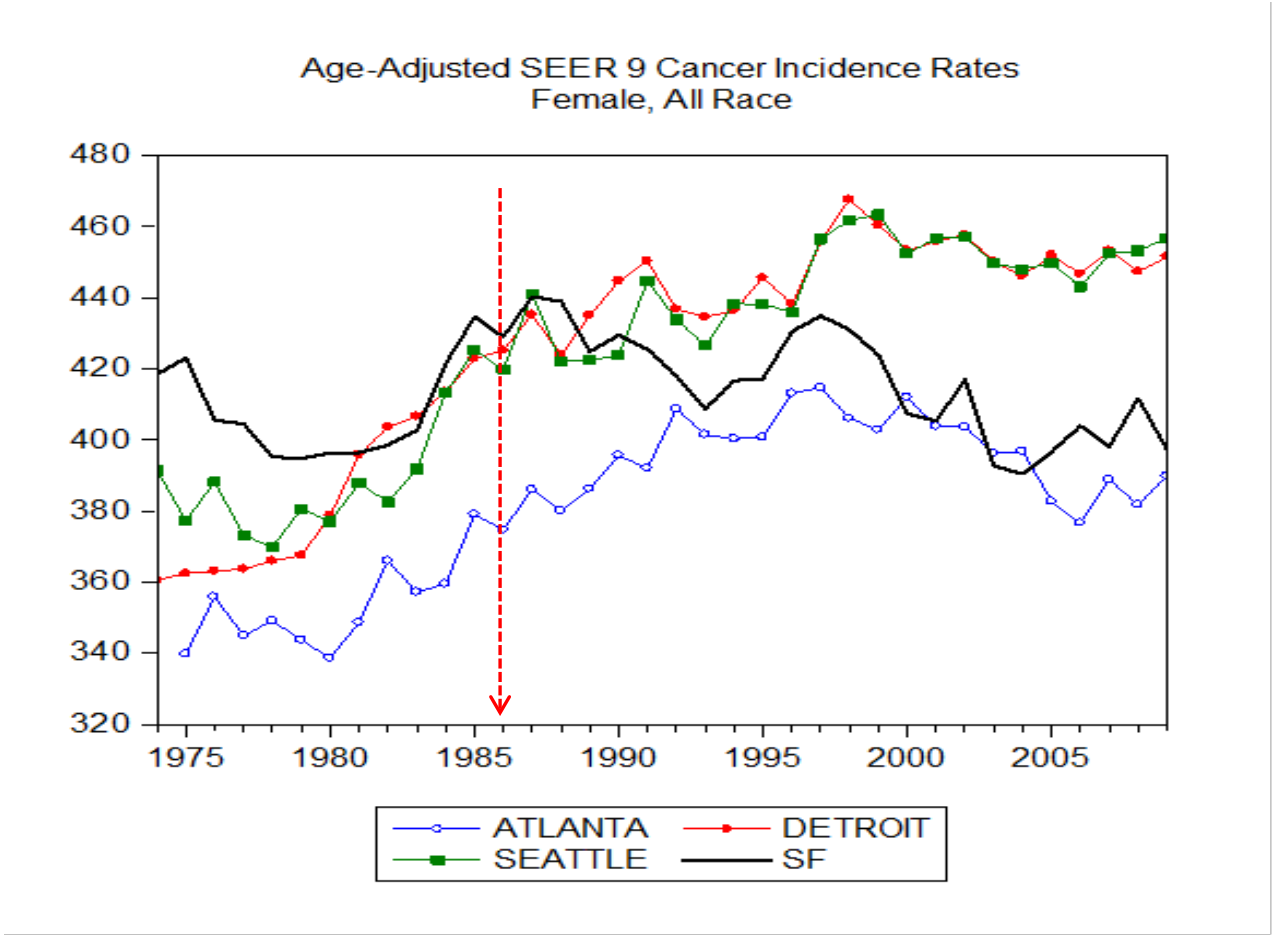
- ***amount/frequency of exposure***
- ***age, genetics, lifestyle… (independent of "right-to-know" law)***
- ***environmental substances exposure assoc. w/ 2–15% of all cancers***



American Cancer Society, California Department of Public Health, California Cancer Registry. California Cancer Facts and Figures 2016. Oakland, CA: American Cancer Society, California Division, 2016


Age-Adjusted SEER 9 Cancer Incidence Rates
All Gender, All Race
600
560
520
480
440
400
360
1975
1980
1985
1990
1995
2000
2005
ATLANTA
DETROIT
SEATTLE
SF


Age-Adjusted SEER 9 Cancer Incidence Rates
Male, All Race
800
750
700
650
600
550
500
450
1975
1980
1985
1990
1995
2000
2005
ATLANTA
DETROIT
SEATTLE
SF


Age-Adjusted SEER 9 Cancer Incidence Rates
Female, All Race
480
460
440
420
400
380
360
340
320
1975
1980
1985
1990
1995
2000
2005
ATLANTA
DETROIT
SEATTLE
SF

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.

	Constant	*Prop65*	*AR(1)*	*Adj. R^2*	*F-Stat*	*DW*	*Q, lag = 2*	*Q, lag =3*
1996	*-4.82 (.77)*	*-.84 (.95)*	*.84 (<.001)*	*.73*	*44.87 (<.001)*	*1.98*	*0.11 (.74)*	*.19 (.91)*
1997	*-17.21 (.09)*	*17.58 (.11)*	*.75 (<.001)*	*.75*	*49.27 (<.001)*	*1.73*	*0.67 (.41)*	*0.73 (.69)*
1998	*10.54 (.70)*	*-15.82 (.20)*	*.90 (<.001)*	*.74*	*47.53 (<.001)*	*2.01*	*0.05 (.82)*	*0.38 (.83)*
1999	*-7.40 (.59)*	*2.55 (.82)*	*.82 (<.001)*	*.73*	*44.94 (<.001)*	*1.98*	*0.08 (.77)*	*0.19 (.91)*
2000	*-17.55 (.07)*	*23.46 (.02)*	*.77 (<.001)*	*.77*	*55.14 (<.001)*	*1.92*	*0.15 (.70)*	*0.17 (.92)*
2001	*-10.16 (.41)*	*7.91 (.51)*	*.80 (<.001)*	*.73*	*45.68 (<.001)*	*2.03*	*0.06 (.81)*	*0.33 (.84)*
2002	*-8.57 (.51)*	*5.53 (.64)*	*.81 (<.001)*	*.73*	*45.28 (<.001)*	*1.96*	*0.14 (.70)*	*0.29 (.87)*
2003	*-5.61 (.70)*	*.09 (.99)*	*.83 (<.001)*	*.73*	*44.87 (<.001)*	*1.98*	*0.08 (.78)*	*0.16 (.92)*
2004	*-6.67 (.62)*	*2.42 (.84)*	*.83 (<.001)*	*.73*	*44.95 (<.001)*	*1.98*	*0.04 (.84)*	*0.11 (.95)*
2005	*-4.76 (.74)*	*-1.87 (.87)*	*.83 (<.001)*	*.73*	*44.92 (<.001)*	*2.00*	*0.09 (.77)*	*0.17 (.92)*

Table 2: Both Sexes, All Race SEER 9 Data, 1974-2009.
Dependent Variable: Detroit-SF
Number of observations = 36.
Mean Dependent Variable = 38.38.

	Constant	Prop65	AR(1)	Adj. R^2	F-Stat	DW	Q, lag = 2	Q, lag =3
1996	103.02 (.09)	-11.46 (.26)	.95 (<.001)	.94	251.79 (<.001)	1.50	2.31 (.13)	3.93 (.14)
1997	52.46 (.03)	22.07 (.03)	.91 (<.001)	.94	282.99 (<.001)	1.60	1.98 (.16)	3.41 (.18)
1998	59.18 (.04)	15.97 (.12)	.91 (<.001)	.94	261.86 (<.001)	1.77	1.08 (.30)	2.54 (.28)
1999	81.48 (.07)	-.71 (.94)	.93 (<.001)	.93	242.12 (<.001)	1.62	1.50 (.22)	3.20 (.20)
2000	69.22 (.05)	8.24 (.43)	.92 (<.001)	.93	247.12 (<.001)	2.17	1.20 (.27)	3.66 (.16)
2001	81.97 (.07)	-1.10 (.92)	.93 (<.001)	.93	242.17 (<.001)	1.62	1.44 (.23)	3.08 (.21)
2002	73.93 (.06)	5.03 (.63)	.93 (<.001)	.93	243.97 (<.001)	1.60	1.55 (.21)	3.05 (.22)
2003	83.71 (.07)	-2.46 (.82)	.94 (<.001)	.93	242.53 (<.001)	1.63	1.33 (.25)	3.05 (.22)
2004	91.79 (.09)	-7.81 (.45)	.94 (<.001)	.93	246.53 (<.001)	1.66	1.10 (.29)	2.76 (.25)
2005	86.10 (.07)	-4.47 (.66)	.93 (<.001)	.93	243.59 (<.001)	1.67	1.20 (.27)	2.99 (.22)

Table 3: Both Sexes, All Race SEER 9 Data, 1974-2009.
Dependent Variable: Seattle-SF
Number of observations = 36.
Mean Dependent Variable = -52.01.

	Constant	Prop65	AR(1)	Adj. R^2	F-Stat	DW	Q, lag = 2	Q, lag =3
1996	61.62 (.35)	.67 (.94)	.95 (<.001)	.88	126.02 (<.001)	2.24	0.89 (.34)	1.29 (.52)
1997	31.70 (.23)	14.78 (.12)	.91 (<.001)	.89	135.04 (<.001)	2.32	1.59 (.21)	2.03 (.36)
1998	29.09 (.22)	16.51 (.09)	.90 (<.001)	.89	137.02 (<.001)	2.51	3.62 (.06)	3.82 (.15)
1999	24.10 (.22)	21.22 (.04)	.88 (<.001)	.89	144.97 (<.001)	2.29	1.48 (.22)	1.90 (.39)
2000	83.08 (.46)	-5.13 (.61)	.96 (<.001)	.88	127.11 (<.001)	2.20	.073 (.39)	0.94 (.62)
2001	62.74 (.38)	0.29 (.97)	.95 (<.001)	.88	126.00 (<.001)	2.24	0.88 (.35)	1.28 (.53)
2002	56.47 (.34)	2.61 (.79)	.49 (<.001)	.88	126.28 (<.001)	2.24	0.94 (.33)	1.47 (.48)
2003	42.34 (.26)	18.24 (.13)	.93 (<.001)	.81	75.24 (<.001)	2.02	0.92 (.34)	0.93 (.63)
2004	57.16 (.35)	2.51 (.81)	.94 (<.001)	.88	126.26 (<.001)	2.24	1.01 (.32)	1.41 (.49)
2005	53.29 (.32)	4.54 (.66)	.94 (<.001)	.88	126.90 (<.001)	2.18	0.58 (.45)	0.88 (.64)

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

$$P(A \cap B \cap C \cap D) = \textit{joint probability of all four events} = ????$$

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)

  unclear connection to public health

- *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

Robinson, Viscusi, Zeckhauser, "Efficient Warnings, Not "Wolf or Puppy" Warnings," Forthcoming in: The Future of Risk Management, Kunreuther, Meyer, Michel-Kerjan, eds. (with E. Blum). Phil: Univ of Pennsylvania Press.