

**The effect SB 905 would have on alcohol-related crashes
& Senator Wiener's *post hoc* fallacy**

Ramón Castellblanch, PhD, Professor Emeritus
Department of Health Education, San Francisco State
June 20, 2018

The science is unequivocal: extending hours of alcohol service by 2 hours as SB 905 proposes would make California's roads and highways more dangerous. SB 905 (Wiener, D-San Francisco) would increase automobile crash deaths, alcohol-related violence, alcohol-related sexual assaults, and sexual behavior that could lead to unwanted pregnancy, sexually-transmitted infection, and losing a partner. Were SB 905 enacted, these harms would increase in and around the cities where extended service is implemented. Senator Scott Wiener's table purporting to show states' hours of alcohol service and their rates of alcohol-related fatal car crashes provides no evidence to the contrary and is scientifically flawed.

A. Alcohol and impaired driving

To see how extending hours of alcohol service could affect alcohol-related crashes, it can be useful to, first, review the effects of blood alcohol concentration (BAC) on drivers. The US Centers for Disease Control and Prevention (CDC) provides the basic facts. Driving, even at BAC below .08, i.e. "buzzed driving", leads to:

- A decline in visual functions (rapid tracking of a moving target)
- A decline in ability to perform two tasks at the same time (divided attention)
- Reduced coordination
- Reduced ability to track moving objects
- Difficulty steering
- Reduced response to emergency driving situations

In addition, driving at BAC .08 or above leads to:

- Impaired concentration
- Short-term memory loss
- Reduced speed control
- Reduced information processing capability (e.g., signal detection, visual search)
- Impaired perception
- Reduced ability to maintain lane position and brake appropriately
- Substantial impairment in vehicle control, attention to driving task, and in necessary visual and auditory information processingⁱ

B. The research problem

Research on the effect of extending hours of alcohol service by 2 hours on alcohol-related harms must also account for confounding factors.

To begin with, there are demographic differences.ⁱⁱ Research has shown that auto wreck rates within a jurisdiction vary by population characteristics such as age^{iii iv}, socio-economic status^v, employment status^{vi vii}, and marital status^{viii}.

In addition, research has shown that states' transportation systems and local driving norms affect alcohol-related car wreck rates. Transportation systems can vary by public transportation options^{ix}, speed limits^{x xi}, road systems^{xii}, and other road users^{xiii}. Local driving norms include preferred vehicle types^{xiv xv}, passengers per vehicle^{xvi}, rates of speeding^{xvii}, mobile phone use^{xviii}, peer pressure^{xix}, and varying state laws on distracted driving^{xx}. Further, death rates can vary by the effectiveness of local law enforcement^{xxi}. They can also vary by local rates of use of other psychoactive substances^{xxii}.

C. Systematic review

To conclusively determine the effect of extending hours of alcohol service by 2 hours on alcohol-related harms, the CDC conducted a systematic review of the relevant research. The review found that the only way that research can show the impact of changes in laws affecting hours of sale at on-premises alcohol outlets on auto wreck deaths is to use studies that had a comparison group or, at a minimum, compared outcomes of interest before and after a change in the policy related to hours of sale.¹

The CDC systematic review found that, "There was sufficient evidence in ten qualifying studies to conclude that increasing hours of sale by 2 or more hours increases alcohol-related harms." This means that the science is unequivocal: as SB 905 would increase hours of sale by 2 hours, it would increase alcohol-related harms, starting with an increase in drunk driving and the harms it causes.

D. *Post hoc* fallacy of Senator Wiener's handout

Senator Scott Wiener's claim that his table purporting to show no connection between states' hours of alcohol service and their rates of fatal alcohol-related crashes is a *post hoc* fallacy. A *post hoc* fallacy is assuming correlation is causation. For example,

Car deaths are positively correlated to the share of voters who voted for the Republican candidate Mitt Romney in the last presidential election (.66), and negatively correlated to the share who voted for Obama (-.66).^{xxiii}

Clearly, voting for Romney does not cause car crashes; so, claiming that voting for Romney will result in a car crash death is a *post hoc* fallacy.

¹ The basic steps of a systematic review are to (1) organize a team of well-qualified researchers with no conflicts of interest in the research; (2) set inclusion criteria to assure that they only use well-conducted research; (3) develop standards for judging the research before reviewing it; and (4) develop a protocol for summarizing research before it.

Senator Wiener's handout does not address the other factors related to alcohol-related car crashes, and therefore promotes a *post hoc* fallacy.

However, the senator's handout may be misleading in other ways.

- The handout provides absolutely no source for its data; but, if the handout's source is NHTSA's *Traffic Safety Facts 2015*^{xxiv}, it includes incorrect numbers
- As even at BAC <.08, alcohol impairs driving, there is no explanation as to why auto fatalities that may be correlated with BAC <.08 weren't counted
- There is no regression to check the data's statistical significance

E. Additional harms not accounted for in the handout

In addition, the handout does not consider many other harms that research shows could be caused by longer hours of sale at on-premises alcohol outlets. Extended hours could also increase alcohol-related:

- Violence^{xxv}
- Sexual assault^{xxvi}
- Risky sex (which can lead to unwanted pregnancy, sexually-transmitted infection, and/ or losing a partner)^{xxvii}

F. Conclusion

California doesn't need more drunk drivers. Senator Wiener's assertion that his table of states' BAC >.08 fatal car crash rates and hours of sale at on-premises alcohol outlets shows no harm in SB 905 is a *post hoc* fallacy. It also fails to consider many other serious harms of alcohol. SB 905 would lead to more car crash deaths and would risk more alcohol-related violence, more alcohol-related sexual assaults, and increased sexual behavior leading to unwanted pregnancies, STIs, and social instability.

ⁱ Impaired Driving: Get the Facts. Centers for Disease Control and Prevention Website https://www.cdc.gov/motorvehiclesafety/impaired_driving/impaired-driv_factsheet.html. Published June 2017. Accessed June 11, 2018.

ⁱⁱ Alcohol Outlets and Our Community: A Health Impact Assessment of the Harms of High Alcohol Outlet Density in Mendocino County, California. Pew Website <http://www.pewtrusts.org/en/research-and-analysis/data-visualizations/2015/hia-map/state/california/alcohol-outlet-density-in-mendocino-county> Published January 2013. Accessed June 9, 2018.

ⁱⁱⁱ General Statistics. Insurance Institute for Highway Safety Website <http://www.iihs.org/iihs/topics/t/general-statistics/fatalityfacts/overview-of-fatality-facts> Published December 2017. Accessed June 9, 2018.

^{iv} Adanu E, Jones S. Effects of Human-Centered Factors on Crash Injury Severities. *Journal of Advanced Transportation*. Volume 2017, Article ID 1208170, 11 pages. doi.org/10.1155/2017/1208170

^v Bates L, Davey J, Watson B, King M, Armstrong K. Factors Contributing to Crashes among Young Drivers. *Sultan Qaboos Univ Med J*. 2014 Aug; 14(3): e297–e305. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4117653/>

^{vi} 2015 Motor Vehicle Crashes: Overview. U.S. Department of Transportation Website <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812318> Published August 2016. Accessed June 9, 2018.

^{vii} Adanu E, Jones S. Effects of Human-Centered Factors on Crash Injury Severities. *Journal of Advanced Transportation*. Volume 2017, Article ID 1208170, 11 pages. doi.org/10.1155/2017/1208170

- viii Social Factors in Road Safety. Royal Society for the Prevention of Accidents Website <https://www.rospa.com/rospaweb/docs/advice-services/road-safety/social-factors-in-road-safety.pdf> Published April 2012. Accessed June 9, 2018.
- ix The Hidden Traffic Safety Solution: Public Transportation. American Public Transportation Association Website <https://www.apta.com/resources/reportsandpublications/Documents/APTA-Hidden-Traffic-Safety-Solution-Public-Transportation.pdf>. Published September 2016. Accessed June 10, 2018.
- x Farmer C. Relationship of traffic fatality rates to maximum state speed limits. *Traffic Injury Prevention* 2017, 18(4):375-380. <https://thenewspaper.com/rlc/docs/2016/iihs-55redux.pdf>
- xi Global status report on road safety 2015. World Health Organization Website http://www.who.int/violence_injury_prevention/road_safety_status/2015/en/ Published 2015. Accessed June 10, 2018.
- xii Social Factors in Road Safety. Royal Society for the Prevention of Accidents Website <https://www.rospa.com/rospaweb/docs/advice-services/road-safety/social-factors-in-road-safety.pdf> Published April 2012. Accessed June 9, 2018.
- xiii Factors Contributing to Motor Vehicle Incident Fatalities in British Columbia (2013). British Columbia Coroners Service Website <https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/death-investigation/statistical/mvi-contributing-factors.pdf>. Published September 2015. Accessed June 10, 2018.
- xiv Surprising Factors that Mean You'll Get Hurt in a Car Crash. The National Trial Lawyers Website <https://www.thenationaltriallawyers.org/2017/05/11-surprising-factors-that-mean-youll-get-hurt-in-a-car-crash/>. Published May, 2017. Accessed June 10, 2018.
- xv 2015 Motor Vehicle Crashes: Overview. U.S. Department of Transportation Website <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812318> Published August 2016. Accessed June 9, 2018.
- xvi Bates L, Davey J, Watson B, King M, Armstrong K. Factors Contributing to Crashes among Young Drivers. *Sultan Qaboos Univ Med J*. 2014 Aug; 14(3): e297–e305. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4117653/>
- xvii 2015 Motor Vehicle Crashes: Overview. U.S. Department of Transportation Website <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812318> Published August 2016. Accessed June 9, 2018.
- xviii Gicquel L, Ordonneau P, Blot E, Toillon C, Ingrand P, Romo L. Description of Various Factors Contributing to Traffic Accidents in Youth and Measures Proposed to Alleviate Recurrence. *Front Psychiatry*. 2017; 8: 94. **doi: 10.3389/fpsy.2017.00094**
- xix Bates L, Davey J, Watson B, King M, Armstrong K. Factors Contributing to Crashes among Young Drivers. *Sultan Qaboos Univ Med J*. 2014 Aug; 14(3): e297–e305. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4117653/>
- xx Distracted Driving. Centers for Disease Control and Prevention Website https://www.cdc.gov/motorvehiclesafety/distracted_driving/index.html. Published June 2017. Accessed June 10, 2018.
- xxi General Statistics. Insurance Institute for Highway Safety Website <http://www.iihs.org/iihs/topics/t/general-statistics/fatalityfacts/overview-of-fatality-facts> Published December 2017. Accessed June 9, 2018.
- xxii Gicquel L, Ordonneau P, Blot E, Toillon C, Ingrand P, Romo L. Description of Various Factors Contributing to Traffic Accidents in Youth and Measures Proposed to Alleviate Recurrence. *Front Psychiatry*. 2017; 8: 94. **doi: 10.3389/fpsy.2017.00094**
- xxiii Florida R. The Geography of Car Deaths in America. CityLab Website <https://www.citylab.com/transportation/2015/10/the-geography-of-car-deaths-in-america/410494/>. Published October 2015. Accessed June 11, 2018.
- xxiv Traffic Safety Facts 2015. US Department of Transportation Website <https://crashstats.nhtsa.dot.gov>. Published 2017. Accessed June 12, 2018.
- xxv Graham K, Livingston M. The Relationship between Alcohol and Violence – Population, Contextual and Individual Research Approaches. *Drug Alcohol Rev*. 2011 September ; 30(5): 453–457. **doi:10.1111/j.1465-3362.2011.00340.x**.
- xxvi Abbey A. Alcohol's Role in Sexual Violence Perpetration: Theoretical Explanations, Existing Evidence, and Future Directions. *Drug Alcohol Rev*. 2011 September ; 30(5): 481–489. **doi:10.1111/j.1465-3362.2011.00296.x**.
- xxvii Alcohol Use and Sexual Risk Behaviour: A Cross-Cultural Study in Eight Countries. World Health Organization Website http://www.who.int/substance_abuse/publications/alcohol_sexual_risk_crosscultural.pdf. Published 2005. Accessed June 12, 2018.

Last Call before 2am =

Last Call at 2am =

Last Call after 2am =

STATE	AUTHORITY	Saturday Last Call	Sunday Last Call	% of Drivers Involved in Fatal Crashes BAC .08+ 2015
Rhode Island	State Statute	6am - 1am	6am - 1am	29
Maine	Maine State Statute	5am - 1am	9am - 1am	27
Wyoming	Hours set in statute	6am - 2am	6am - 2am	27
Connecticut	State Law	M-Th 9am - 1am, F 11am - 1am		27
North Dakota	Attorney General	8am - 2am	12pm - 2am	27
Alaska	State Law	8am - 5am	8am - 5am	26
Montana	State Statute	8am - 2am	8am - 2am	26
Texas	State Legislature	7am - 2am	7am - 2am	26
Oregon	OLCC	7am - 2:30am	7am - 2:30am	25
Hawaii	Liquor Commission	6am - 4am	6am - 4am	24
Idaho	State Legislature & Stat	10am - 1am, 2am	Local Control	23
New Mexico	State Legislature	7am - 2am	7am - 2am	23
South Dakota	State Legislature	7am - 2am	7am - 2am	23
Louisiana	No Rules	24 hrs	24 hrs	23
Massachusetts		2am	2am	23
Wisconsin		Sun - Th 2am, Fri-Sat 2:30am		23
New Hampshire	State Legislature	6am - 1am	6am - 1am	22
Delaware	Generally Assembly	9am - 1am	9am - 1am	22
Illinois	Local Control	Sun - Fri 4am, Sat 5am		21
Nevada	No Rules	24hrs	24hrs	21
South Carolina	Local Control	2am	2am	21
Alabama	State Legislature	State Legislature	State Legislature	20
Pennsylvania	PLCB & State Legislature	7am - 3am	7am - 3am	20
Vermont	Vermont Department of	8am - 2am	8am - 2am	20
Arizona	State Legislature	6am - 2am (unfinish)	6am - 2am (unfinish)	20
D.C.		Sun - Th 2am, Fri-Sat 3am		20
Maryland	State Legislature	2am	2am	20
New York	Local Control	4am	4am	20
North Carolina	State Legislature & Local	7am - 2:30am	12pm - Local Option	19

Virginia	Virginia ABC	6am - 2am	6am - 2am	19
West Virginia	State Legislature	7am - 3:30am	1pm - 3am	19
California	State Legislature	6am - 2am	6am - 2am	19
Michigan	State Legislature & Local	7am - 2am	7am - 2am w/ Local	18
Mississippi	State Legislature	10am - Midnight	Prohibited unless all	18
Arkansas	State Legislature	7am - 5am	7am - 5am	18
Colorado	State Statute	7am - 2am	7am - 2am	18
Florida	Local Option			18
Minnesota	State Legislature	8am - 2am	10am - 1am	18
Washington	State Legislature & Local	6am - 2am	6am - 2am	18
Nebraska	Local Control	2am	2am	18
Tennessee		3am	3am	18
Iowa	State Legislature	6am - 2am	8am - 2am	17
Ohio	State Legislature & Local	5:30am - 2:30am	10am - 12am. Permi	17
Georgia	Local Option			17
Kansas	State Legislature	9am - 2am		17
Kentucky	Local Control	4am (Louisville)	4am (Louisville)	17
Missouri	Local Control	3am	3am	17
Oklahoma		2am	2am	17
Indiana	State Statute	7am - 3am	7am - 3am	14
New Jersey	Local Control	24hrs (Atlantic City)	24hrs (Atlantic City)	14
Utah	State Legislature	10am - 1am	11:30am - 1am	9