



Alert eyes and DWIs: An indirect evaluation of a DWI witness reward program in Stockton, CA

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ABSTRACT

We evaluate a “grassroots” anonymous reward program targeting drunken driving in Stockton, CA. The time-series cross-sectional data covers 19 years for Stockton and six other California cities. Exploiting interrupted time-series regression, Zellner’s seemingly unrelated regression (SUR) framework, and bootstrapped standard errors, we test for an impact of this program on alcohol-related injury or fatality accidents, the proportion of all accidents involving alcohol, and the number of DWI arrests. In its first decade, the citizen reward program appears to have averted some 275 alcohol-related accidents for social cost savings of between \$21,000 and \$5.6 million. Further, possibly 4495 arrests were precluded, saving some \$1–3 million in arrest-related costs. Incentivized public monitoring of driving-after-drinking may be an effective drunken driving abatement program though our exploratory findings need further confirmation.

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1. Background

1.1. The costs of alcohol-related arrests and crashes

Drunken driving is rarer than it was in the 1980s and incremental progress against driving-while-intoxicated (DWI) appears to have slowed (Sweedler et al., 2004). In 2004 alcohol played a role in 16,694 traffic fatalities nationwide, accounting for two-fifths of all traffic fatalities (NHTSA, 2005). This statistic reflects only those fatal traffic incidents where alcohol was detected and omits the quarter of a million individuals injured but not killed nor events categorized as “property-damage-only” (PDO). In monetary terms, each year drunken driving costs tens of billions of dollars (Harwood, 2000; Miller et al., 1996). Alcohol-involved crashes obviously result in costs (e.g. medical treatment, property damage, lost wages, legal proceedings, etc.). The severity of the injuries and/or damages in each event determines the costs of these crashes (Blincoe et al., 2002).

Drunken driving does not always end with a collision; police may be able to prevent collisions or other accidents by making an arrest. Estimates of the resource costs incurred from a DWI arrest through conviction have been made by Kenkel (1993): \$225 per arrest, \$40 per jail-day, and \$500 per earliest possible guilty plea, rising quickly thereafter if the arrest is contested. Assuming a minimum of 1 day

spent in jail and an immediate “no contest/guilty” plea, the resource cost per arrest ranges from \$265 to \$765.

A wide range of efforts to avert the costly impact of drunken driving have been tried: increased police resources, more sobriety checkpoints and intensive patrols (Benson et al., 1999, 2000); stricter blood alcohol concentration (BAC) laws, raising the minimum legal drinking age (Eisenberg, 2003); reducing retail alcohol outlet densities (McCarthy, 2003); enacting a common-site sales ban on alcohol and gasoline (Farmer et al., 2005); increasing alcohol taxes (Young and Bielinska-Kwapisz, 2002, 2006; Mast et al., 1999); impounding vehicles (DeYoung, 1999; Voas and DeYoung, 2002); and targeted ignition-interlock programs (DeYoung, 2002). While this paper does not attempt to fully review the scope of the drunken driving literature, it informs the policy and enforcement discussion of the potential for positive incentives against drunken driving in US. In Stockton, CA, a secret witness program using monetary rewards to deter a suspected drunk driver is found to be viable and effective.

1.2. Drunken driving countermeasures in Stockton, CA

Stockton is a city in the Central Valley of California and the seat of San Joaquin county. Like other Central Valley communities, Stockton has had a history of low average incomes (see Table 1) among other challenges.

In the late 1970s Stockton, CA was the site of a seminal intensified DWI enforcement (described by Voas and Hause, 1987). The protocol employed periodic intensified police patrols for DWIs, reverting

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Table 1
Selected census characteristics, Stockton and six comparison communities, 1980, 1990, and 2000.

Year	Stockton	Bakersfield	Fresno	Modesto	Redding	Riverside	Sacramento
Population							
1980	149,779	105,611	218,202	106,602	41,995	170,876	275,741
1990	210,943	174,820	354,202	164,730	66,462	226,505	369,365
2000	243,771	247,057	427,652	188,856	80,865	255,166	407,018
Black							
1980	10.5%	10.5%	9.8%	2.1%	1.3%	6.9%	13.4%
1990	9.7%	9.7%	8.3%	2.6%	1.0%	7.4%	15.3%
2000	11.0%	9.0%	8.1%	3.6%	0.6%	7.1%	15.3%
Hispanic (any race)							
1980	22.1%	15.1%	23.5%	10.5%	2.5%	16.1%	16.3%
1990	–	–	–	–	–	–	–
2000	32.5%	32.5%	39.9%	25.6%	5.4%	38.1%	21.6%
Per capita income							
1980	\$6,834	\$8,303	\$6,792	\$7,797	\$7,491	\$7,652	\$7,605
1990	\$11,331	\$14,183	\$11,528	\$13,572	\$13,040	\$14,235	\$14,087
2000	\$15,405	\$17,678	\$15,010	\$17,797	\$18,207	\$17,882	\$18,721

Source: US Bureau of the Census.

to periods of more normal staffing. Voas and Hause (1987) concluded that the intensified police patrols significantly reduced the number of nighttime accidents where a strong correlation exists between single vehicle nighttime accidents and drunken driving. Hence, reducing drunken driving events will result in a reduction of nighttime crashes. A practical limitation of their intervention was the fiscal challenge to maintain the intensified patrols for a more permanent reduction in accidents. Alcohol-related injury and fatality crashes (ARIFC) and arrests for DWI trended back toward pre-intervention levels in Stockton after the experiment concluded.

Little more than a decade later in late 1990, spontaneously a grassroots DWI intervention arose in Stockton. It was a secret witness reporting reward program, started by concerned citizens and conducted in cooperation with the Stockton Police Department. The program concept was straight forward: information leading to the arrest (but not necessarily subsequent conviction) of a drunk driver resulted in a \$100 reward to the anonymous tipster. The reward fund was donated by concerned individuals, some who lost loved ones to drunken driving accidents. The mechanism of the program plays out as a concerned member of the public would call the Stockton Police Department with a description of the suspected vehicle/driver and direction of travel; they would be asked for a self-selected number for the purposes of claiming the possible reward. (Note that this program was initiated largely before the widespread use of mobile phones.) The individual was assured of their anonymity. If a DWI arrest was made on the basis of the anonymous information, the individual's self-selected number was forwarded by the police to a local cooperating bank. The concerned person could then collect the \$100 cash reward from the bank by revealing their self-selected number to the appropriate bank staff.

If this program successfully tapped into the alert eyes of the thousands of community residents, the potential for increased surveillance is substantial. The prevalence of drunken driving – especially among young and high-risk drivers – can be positively influenced by the volume of news coverage devoted to drunken driving (Yanovitzky, 2002). And if Stockton drinker-drivers perceived that the likelihood of detection had increased, according to standard Deterrence Theory, DWI should be a less frequent event than before. Finally, ideally, a lesser prevalence of DWI should reduce the costly and tragic results of DWI.

Two similar programs experimented with active citizen involvement in the DWI reporting process. In Maryland, the program "Operation Extra Eyes" funded specific training for volunteers who were periodically deployed, with police communication equipment, to patrol for drunk drivers and report to police for

enforcement action. Though quite popular with local law enforcement, formal evaluation of the efficacy of Maryland's structured volunteer surveillance program was inconclusive (Kelley-Baker et al., 2006). Tennessee's Emergency Cellular Telephone program conducted a publicity campaign to encourage cellular phone users to call the highway patrol to report suspected drunk drivers and other traffic hazards (D'Alessio et al., 1999). D'Alessio and co-authors demonstrate, using time-series analysis, that alcohol-related automobile crashes decreased on state highways serviced by the program, whereas on state roadways outside the program jurisdiction the number of collisions involving alcohol did not decline. Those authors recognize the limited scope of their analysis and that further research will be necessary. Nevertheless, they suggest, "These programs are appealing not only because they are cost effective, but because they enable average citizens to police themselves" (D'Alessio et al., 1999, emphasis added). But merely encouraging witnesses to "do the right thing" may not be enough to offset the individual's expected cost-benefit.

Our study makes an evaluation of the Stockton secret witness program by comparing the number of alcohol-related injury and fatality collisions, the share of vehicle collisions attributed to alcohol intoxication, and DWI arrests in Stockton to the same measures from similar California communities. Due to the unavailability of certain internal data, this analysis is conducted "from the outside looking in" using publicly available measures.

2. Model, data, and methods

2.1. Conceptual model of drunken driving and related outcomes

We acknowledge that the actual measure of interest, the prevalence of DWI, is not measured by official statistics; data that are collected include the number of ARIFC and the number of driving-while-intoxicated arrests (DWI.ARR). The proportion of all injury and fatality traffic accidents attributed to alcohol involvement (PROP.ALC) is also included to probe that the decline in ARIFC does not simply reflect an overall decline in traffic collisions. For this analysis, we use the following three equations:

$$ARIFC_{it} = f(DWI_{it}, TS_{it}, X_{it})$$

$$\text{where } i \text{ indexes community and } t \text{ indexes time} \quad (1)$$

$$PROP_ALC_{it} = g(DWI_{it}, TS_{it}, X_{it}) \quad (2)$$

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