

Alcohol Interlock Programs: A Global Perspective

**Proceedings of the Sixth International Symposium
on Alcohol Ignition Interlock Programs**

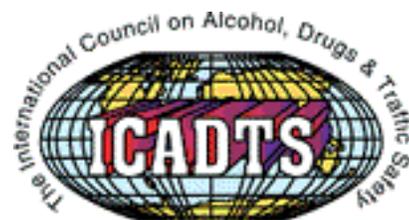
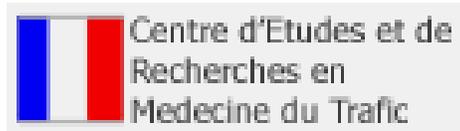
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**Robyn D. Robertson
Ward G.M. Vanlaar
Douglas J. Beirness**

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The Development of Interlocks in Sweden

Tom Bjerver

**Swedish Abstaining Motorists' Association
Sweden**

Introduction

Interlocks have been commercially available in the United States and Canada since the 1980s. They were introduced as part of the legal system to combat drink driving. Due to low demand and a lack of acceptance during this period, the development and evolution of these products was slow and cost of the devices remained high.

At the end of the 1980s, an attempt was made to introduce interlock devices in Sweden. I was then employed in the field of company health services. Together with scientists, insurance officials as well as a company associated with the development of the interlock technology, I called upon a number of authorities, politicians and organizations in an effort to engage their participation. However their response to and interest in the use of these devices was limited. At that time, it was considered impossible to form a public opinion on the use of interlock devices in Sweden. However, following the introduction of an experiment involving the conditional revocation of driving licenses for apprehended drunk drivers in 1999, we drew the attention of the different stakeholders.

More recently organizations, politicians, ministries, and government authorities, as well as car manufacturers and the after market industry, have been increasingly positive toward the use of interlocks. More agencies and organizations are taking some responsibility for and playing a role in the introduction and development of interlock programs. In addition, municipalities and other industries involved in and responsible for transportation are demanding the use of interlock devices to improve the quality of transport services.

In order to continue expanding the use of interlocks in Sweden, ongoing efforts are needed to improve the technology associated with these devices. It must be more consumer-friendly, reliable and the benefits of the device must be equal to its costs. It is only at this point that the goal of "interlocks in all cars" can be attained.

Context

In 1997 the Swedish parliament developed a plan called "Zero Vision". Its goal is to reduce the number of victims of road accidents to 270 by the year 2007. In 2004, there were 480 fatalities registered. Since the Zero Vision target was set, the number of victims of road accidents has decreased. However, 25-30% per cent of all victims of road accidents are still a result of impaired driving. In order to achieve the goal of Zero Vision, much more work is needed.

In Sweden the total annual social costs (deaths, injuries and property damage) of traffic accidents involving alcohol equals almost €900 million. Alcohol consumption in Sweden has increased by about 30 per cent since its entry into the European Union. At present there are no indications that the increasing consumption will decline during the next few years. In light of this, strong measures will be necessary to reduce drunk driving.



Achieving the goal of interlocks in all vehicles in the near future may be the most effective means of reducing social costs, in addition to increasing the number of breathalyser tests conducted by the police. In the long term, greater prevention efforts targeting new and younger drivers are also required to improve safety.

Politics

Today drunk driving is considered socially unacceptable in Sweden. Nevertheless it is estimated that there are more than 14,000 drunk driving trips every twenty-four hours. The trend of steady declines in drunk driving during the last several decades has shifted and fatalities and injuries are now increasing. This has created anxiety and frustration among responsible authorities, stakeholders and politicians. Among politicians it is now easier to achieve agreement on measures to combat drink driving. In the past, however, many politicians adopted a 'wait-and-see' policy towards interlock programs.

Interlock Commission

On October 7, 2004, the Swedish Government decided to organize a commission on interlocks. Various possibilities are to be analysed and discussed according to the following terms of reference and a final report to the commission is due June 1, 2006.

- Interlocks in all vehicles by 2012.
- Interlocks in certain vehicle categories by 2010 (e.g., lorries and school buses).
- Measures to increase acceptance of the expanded use of interlocks.
- Stimulating research and development of new devices.

The commission has recently released a progress report. The following issues were considered to identify ways to increase the acceptance and use of interlocks:

- Anchoring interlocks in rules and regulations relating to technical requirements, testing, etc., to create responsibility for agencies.
- Including interlocks as a tool for improving work environments and rehabilitation.
- Creating demand for interlocks in the purchase of passenger and freight transportation.
- Identifying a strategy regarding demands on police for the quality and number of breathalyser tests.
- Imposing tax rules on fringe benefits that are only applicable to interlock-equipped vehicles.
- Limiting compensation for road accident damage for drunk drivers causing their own injuries.
- Providing access to information about traffic offences and insurance premiums as they relate to risk of injuries.
- Transferring traffic damage costs to traffic insurance.
- Protecting our perspective on and commitment to drunk driving victims.
- The Swedish National Road Administration's general responsibility for alcohol in traffic – a common strategy and co-ordinated efforts.



- Making the interlock a condition to retain a driver's licence.
- Making the interlock compulsory for individuals who are sued for drunk driving.

Opinion

As an independent organization influencing public opinion, the Swedish Abstaining Motorists' Association wanted to find out if the politically announced aggravation was justified. In a public opinion poll conducted by an independent institute, it was concluded that an overwhelming majority (79%) of the sample were supportive of legislation relating to the use of interlocks. In a separate public opinion poll, 80% of the persons surveyed indicated they were prepared to pay approximately € 200 extra for a new car equipped with an interlock.

There is no doubt that this issue has been covered in a positive way by the Swedish media, including TV, radio and various newspapers. This has helped spread knowledge about the use of interlocks. Additionally, a number of dramatic and tragic drunk driving road accidents publicized in the national press have further improved the acceptance of interlocks among the Swedish public.

Among commercial vehicles, where interlocks are used frequently, reports are positive, particularly when high quality products have been installed on the vehicles. Drivers easily learn how to operate the device, which is considered easier to use than a GPS navigation system. Usually drivers also agree that any inconvenience associated with using the device is acceptable as impaired drivers can give professional companies a bad reputation.

Market

The program initially developed for convicted drunk drivers involved only one type of interlock device. This product was tested and found reliable and suitable for the program. However, the approval of a single device resulted in a lack of competition among manufacturers. Consequently, the price of the approved device was quite high. This initially delayed the development of the program because potential buyers were hesitant to purchase the device, or they refrained from buying it altogether. However, more manufacturers are now showing an interest in the Swedish market and are contacting potential retailers to offer their services.

The current competitive situation that exists in Sweden is also being threatened due to the approval of a few inferior-quality products. This could potentially jeopardize the general acceptance and credibility of interlock devices. There have been some praiseworthy Swedish initiatives to introduce cheaper interlocks based on semiconductor techniques. If this turns out well, it is suggested that manufacturers invest as much in product development as they have in marketing strategies. Inferior interlocks have appeared on the market and have caused quite a lot of problems for their users. The Swedish Abstaining Motorists' Association has attempted to limit the use of inferior devices by distributing objective consumer information. In a few instances, the association has been threatened as a result of their challenging the effectiveness of certain products.

Today more than 5,000 interlocks are being used in the Swedish transport market. They have been installed both voluntarily and in connection with demands made when purchasing transport services. Companies transporting passengers or dangerous goods were the first to use the devices, followed by several taxi companies and driving schools.



In August 2005 the Swedish Abstaining Motorists' Association conducted an investigation to determine the extent to which Swedish municipalities have implemented interlocks. The investigation included 84 of 250 municipalities. Twenty-eight percent of municipalities have agreed to demand interlocks when purchasing transport services, 30% have decided to demand interlocks when purchasing school transport services, and 23% of the municipalities or municipal owned companies have decided that interlocks should be installed in all vehicles purchased. With regard to county traffic companies, however, only six municipalities have demanded interlocks.

This segment of the market is critical to the development of interlock programs as the government commissions its authorities to recommend interlocks in the Zero Vision strategy. Installing interlocks in commercial vehicles has become easier with the consent of trade unions, who require that interlock devices are alcohol specific and devices are included in any actions plans involving employees with alcohol problems.

It is also expected that other vehicles will be fitted with interlock devices, such as cars for official use and rental cars, etc. However, this will not be possible until prices have decreased. The last step in the process involves the use of interlocks in private vehicles. To successfully achieve this goal, it is necessary that car manufacturers adapt the device to new vehicles. In Sweden SAAB and Volvo, both known for their safety innovations, have taken an active role in road safety improvements.

The interlock manufacturers of today seem to be satisfied with the current quality of their products. After having reviewed the world market we have found that the number of jurisdictions around the world using these devices and the level of competition that exists between manufacturers to be surprisingly poor. It is hoped that manufacturers will more actively market their products so consumers will benefit from improved and less costly devices.

Guarantee of quality

Creating technical standards governing the use of interlocks is a necessary and important step in the development of programs. The creation of a technical standard for Europe is currently being undertaken by the CENELEC committee -- a non-profit technical organization composed of the National Electrotechnical Committees of 28 European countries. In Sweden, discussions are ongoing between the Swedish National Road Administration and Motorists' Association concerning the adaptation of standards to Swedish needs.

At present, two quality standards are being developed -- one for the Rehabilitation Program (RP) relating to convicted offenders; and, one for Transport Quality (TQ) of commercial vehicles. The Swedish Abstaining Motorists' Association also desires a third standard for private vehicles (PV). This last standard is important to permit car manufacturers to design new vehicles that can meet the necessary requirements.

Differences in climate across European countries can further complicate the standardization of interlocks. A device that works well in a mild climate may totally malfunction in the northern part of Sweden where temperatures lower than -30 degrees Celsius are not uncommon in winter months.



Products

Today there are approximately twenty different interlocks on the world market. The prices range from about € 300 to € 1,500. The technical requirements and purposes of the interlock devices are, however, different. A more detailed description and judgement of the products is provided in another paper included in these symposium proceedings.

Possibilities

The development of the interlock device is by no means comparable to the development of mobile phones or computers. Earlier devices used as part of an experiment with convicted drunk drivers have become out-dated. However, devices today are very reliable if calibrated appropriately. In Sweden, field trials stimulate the market to create healthy competition among manufacturers. This will both improve the devices themselves and also reduce prices in the long run. There are also discussions about various technical fundamental conditions.

An experiment involving passive sensors, which uses the same infrared technique as breath testing devices used by police, is also currently operational. If the device functions satisfactorily, it registers the presence of alcohol molecules in the interior of the car. A positive result can lead to a demand by police for the driver to submit to a breathalyser test. The pilot test has had promising results, but it is still too early to determine how it will function in a large-scale operation.

Researchers, car industry, authorities and the Motorists' Association are also interested in the development of a technique for detecting other drugs than alcohol. This technique, known as horizontal gaze nystagmus (HGN) is based on changes in the function of the eye. It is possible to register the influence of alcohol on drivers as well however, its effectiveness in detecting the lower alcohol levels legislated in European countries is uncertain.

Threats

High costs, inferior quality products, functional difficulties, and handling problems are probably the most serious threats impeding the expansion of interlock programs. An inconsistent network of service providers and services could also limit program expansion further. The development of more advanced, modern products for use in new vehicles is also critical. Customers of today are sensitive to such features and they must be both functional and attractive as well as easy to use.

Inferior quality products that produce false negative BAC readings are also an important issue. These products do exist and can have serious implications for issues of legal responsibility if not adequately resolved.

Worldwide

Since the Minister of Industry, Employment and Communications announced legislation relating to interlocks in all new cars by 2012, there has been increasing international interest in the development of interlock programs in Sweden. The traditional Swedish demand that connects the purchase of new transportation services to environmental and road safety factors has also made an impression on the international community. The voluntary use of a road safety



device, such as interlocks, appears to be a typical Swedish phenomenon. By signing the Swedish public road safety agreement, the Motorists' Association has become involved in the use of interlocks. The Association also intends to do the same in a European perspective by signing the European Road Safety Charter, the equivalent to the Swedish "Nationell Samling".

It is important that the Swedish government rely on efforts by the European Union to facilitate the development of interlock programs. It is also important that interlocks become a favourable safety factor in Euro NCAP.

From the considerations of the interlock commission it appears desirable that Sweden set an example, if necessary together with another country, in the development of interlock programs.

Summary

Sweden has made significant advances in the development of interlock programs in the last few years. Not so very long ago key organizations were uninterested and uninvolved in the development of interlock programs. Today these programs have considerable acceptance. Perhaps in the near future, interlock devices will be as natural as airbags and seat belts already are today. When first introduced, seatbelts were perceived as expensive, non-user friendly and sometimes even dangerous, yet today every vehicle has seatbelts and their safety benefits have been well-proven.

An independent organization like the Motorists' Association, supported by people endorsing its mission, is looking forward to further developments in the field of interlocks. The success achieved to date has been a result of:

- Information retrieval
- Know-how
- Timing
- Management
- Strategies

We hope that the development of interlock programs based on these factors will spread rapidly throughout Europe. Interlock manufacturers have been cooperative in working with the Motorists' Association in an open and trusting atmosphere. Building political support for road safety policies also requires multiple partners. Interlock and auto manufacturers also require indications from the public which will influence the conditions of competition. Then consumers will decide whether the devices offered are acceptable.



Interlocks for First Offenders: Effective?

Robert Voas,¹ Richard Roth,² and Paul Marques¹

¹ Pacific Institute for Research & Evaluation, Calverton, MD

² Impact DWI, Santa Fe, NM

Introduction

In the United States, vehicle alcohol interlocks have been most widely used for multiple driving-while-impaired (DWI) offenders based on the general belief that they are most needed by and most effective for individuals who cannot control their drinking. Because a DWI arrest is a low-probability event, multiple DWI offenders have demonstrated their lack of control and are subject to substantial periods of license suspension during which the installation of an interlock has been shown to reduce recidivism substantially. Arguably, first offenders have better control over their drinking and should be more likely to respond appropriately to license suspension—that is to conform to the no-driving requirement and if they do drive illicitly to avoid drinking. In addition in most states, their suspension periods are shorter (3 to 6 months rather than 1 to 2 years) providing less time for the interlock to impact recidivism. Conversely, first offenders are more numerous than second offenders, so that even if the interlock has less effect per driver, overall, the larger number of offenders can potentially have as large an impact on impaired driving.

Voas et al.'s (1999) study of 1,982 first DWI offenders in Alberta, Canada, found that interlocks reduced recidivism by 75%. Conversely, DeYoung, Tashima, and Marsden (2002) found that first offenders ordered by the court to install interlocks exhibited recidivism rates that were not statistically different for similar offenders who did not receive such orders. The two studies differed, however. Voas et al. had the interlock installation and removal records for all the Alberta offenders, whereas DeYoung, Tashima, and Marsden did not have similar records for their study, so they could not determine the number of offenders who actually installed interlocks.

The State of New Mexico provided an opportunity to study the impact of the installation of interlocks on first offenders. During 2003 and 2004, the New Mexico courts convicted 15,977 drivers of DWI for the first time. Of those, 3,142 offenders were excluded from the study because they either had out-of-state zip codes or had never obtained a New Mexico driver's license. The remaining 12,835 first offenders were divided into an interlock group and a comparison group. The interlock group was comprised of first offenders (N 862) who installed an ignition interlock within 90 days of their conviction and had no DWI arrests or convictions between that first conviction and installation of the interlock. (If they had such an additional arrest, they became second offenders.) Of this group, 623 offenders had their interlocks removed, and 239 offenders still had their interlocks installed on March 31, 2005, the last date on which DWI arrest data were available. Fifty percent of the interlocks were removed in 90 days. A comparison group was formed from those 11,973 DWI offenders, convicted for the first time in 2003–2004, who did not install interlocks.

Of the 862 persons in the interlock program, 51 were re-arrested before March 31, 2005: 16 before the interlock was removed and 35 after the interlock was removed. While interlocks were installed, the recidivism rate was 16/862 or 1.86%. As the average installation time was 193 days, the recidivism rate per year was $(1.86\%/193\text{days}) \times 365 \text{ days/year} = 3.5\%$ per year. The 623 first offenders who removed the interlock before March 31, 2005, had a recidivism rate of



6.53% in the period after the devices were removed. For the entire time between interlock installation and the end of the study period, $51/862 = 5.9\%$ of the interlock group were rearrested. The average time between the interlock installation and the end of the study period was 420 days; thus, the recidivism rate was $(5.9\%/420 \text{ days}) 5.14\%$ per year.

The recidivism rate of the control group was calculated by dividing the number of persons who were rearrested (1,070) by the number of persons in the group (11,973). So the recidivism rate was 8.94% in an average follow-up time of 461 days from first conviction to the end of the study period. The corresponding recidivism rate per year is 7.09%. Cox survival analysis demonstrated that the 3.5% annual recidivism rate during the period the interlock was in place for the interlock group was significantly lower than the 7.09% annual rate of the comparison group (odds ratio .48, $p < .01$). Although the postinterlock recidivism rate was not significantly lower than the overall control rate, the reduction experienced during the period the interlock was installed was preserved through the entire study period, as demonstrated by the statistically significant lower overall recidivism rate for the interlock group (5.14% compared to 7.09%; odds ratio .72, $p < .05$).

Acknowledgement

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References

- DeYoung, D. J. (2002). An evaluation of the implementation of ignition interlock in California. *Journal of Safety Research*, 33(4), 473–482.
- Voas, R. B., Marques, P. R., Tippetts, A. S., & Beirness, D. J. (1999). The Alberta Interlock Program: The evaluation of a province-wide program on DUI recidivism. *Addiction*, 94(12), 1849–1859.



Some objective differences between first and multiple offenders

Paul Marques, Robert Voas, and collaborators
Pacific Institute for Research and Evaluation
Calverton, MD

Safety concerns often give primary focus to the risks posed by:

- repeat DWI offenders,
- those who injure others while driving impaired, or
- those with high arrest BAC levels regardless of the number of prior offenses.

However, we should not make the assumption that DWI offenders who do not rise to those same levels of concern are not important safety threats. This paper will summarize some available objective criteria that differentiate the high BAC, or hard core or multiple offender from the average first time DWI. The need to document these differences has been made necessary by much emphasis on high risk offender that may have led to an under-emphasis on the first offender. We should remember that the “first” offender is often not really a first-time offender but arbitrarily defined as a first time offender by plea bargains between the court and the offender, or a natural consequence of periodic record purges. Also, evidence from multiple DWI investigators including Borkenstein, Miller, Voas, Hingson, and others has shown that for each DWI conviction there have been 300-2000 episodes of impaired driving that have not resulted in an arrest. The first-time convicted offender who has never before been impaired while driving is a very rare bird.

We are able to objectively distinguish these offender subtypes because of two relatively new developments in monitoring technology. These include the daily record of interlock BAC tests that unfold at an average rate of 7-8 tests per day during a period of interlock controlled driving, and alcohol biomarker information that is captured in hair, blood or urine samples taken from convicted DWI offenders.

We present the following data elements to highlight these differences:

- Percent who are re-arrested after interlock
- Number who are re-arrested
- Percent with alcohol abuse or dependence DSM-4 or ICD-10 diagnoses (caution here because having a DWI adds to a positive diagnosis)
- Levels of self-reported alcohol consumption
- Percent with alcohol biomarker elevation
- High interlock BAC tests (overall and morning)
- Attempts to bypass the interlock

From the Maryland driver record files, Rauch et al. have reported that an analysis of millions of alcohol related events (including arrests without convictions) on the driving record showed that first time convicted offenders have ten times that rate of alcohol events on their records than do



non-offenders. They also report that second offenders have about 25% more such events than first offenders and that third time offenders have a third more than second offenders. The biggest proportional difference by far is between non-offenders and first offenders. Since we know that there are vastly more first time offenders than multiple offenders the population level risk of these first offenders is itself very significant. In New Mexico for example in 2004, Roth and colleagues have shown that first time offenders are twice as common as second offenders. It is well known that half to two-thirds of all alcohol offenders in an average year in most states and provinces are defined as first offenders.

In Alberta we have an alcohol biomarker study underway in which both multiple and first time offenders are using interlock devices and providing blood and hair samples as part of a research study to characterize differences. The most widely used biomarkers gamma glutamyl transferase (GGT) and percent carbohydrate deficient transferrin (%CDT) do not differ statistically by group, nor do the levels of phosphatidyl ethanol (PEth) – the most predictive of all the biomarkers studied to date – differ by prior offense category. A scatter of PEth and GGT confirms that these markers are strongly related to each other ($r=.53$), but that separately the values for first and multiple offenders who were willing to provide samples for this investigation do not differ significantly from each other.

This is not to say, however, that there is no difference between first and multiple offenders on biomarker evidence. When we examine the Z scores (standard deviation units) of distributions for first and multiple offenders for all biomarkers, the mean values of markers are uniformly higher for multiple offenders than for first offenders but in no cases are these distributions statistically significantly different. That is with the sample sizes we have to date, there is no blood evidence basis for suggesting that there are qualitative differences between first and multiple offenders but that in the aggregate, multiple offenders appear to be more dependent, consume more and that the average multiple poses more of a risk than the average first. Interestingly, perhaps even greater differences emerge on the basis of self-reported drinking (in the past 30 days) based on the Timeline Followback (TLFB) and the Computerized Diagnostic Interview Schedule (C-DIS). Important differences in the amount of drinking are documented between these groups. Self-report in a research study where there are no consequences for honest disclosure are likely to be more accurate than if used as a metric for compliance in the real world.

Performance differences between multiple and first time offenders can be documented from the interlock record. We know that the rate of repeat offenses is higher following the interlock removal for multiple offenders than for first offenders, however, we have also documented that within the class of first offenders the rate of elevated interlock tests is highly predictive of repeat offenses, independent of prior arrests. Accordingly the combination of interlock BAC tests and the objective information provided in the blood and hair markers can help us triangulate in on the offenders who pose the greatest public safety risks. This type of information can elevate the sensitivity of predictive profiling. In other words, while multiple offenders pose larger risks than first offenders – if we use the information in the interlock log record, it can specifically help us to scale risk based on actual driving performance (assuming we can tie the interlock data to an individual driver).

Among the predictive profiling work we have previously reported is the relative importance of prior DWI offenses and the rate at which early morning start up attempts result in elevated BAC tests. We have reported in both Alberta and Quebec data that those who have high rates of morning elevated tests are far more likely to be rearrested and convicted at a later time. This is



either as predictive (Alberta) or more predictive (Quebec) than status as a first of multiple offender.

In other interlock data sets, we have shown that multiple and first offenders can be distinguished on the basis of willingness to attempt to override or bypass the interlock.

Quebec for example allows for such a distinction. In such data we find that multiple offenders are slightly more willing to risk bypassing the interlock to get a car started than are first offenders.

All conclusions from these data are restricted to participants in interlock programs, so they may not be representative of all DWI offenders, but given that caution the data show...

- Multiple offenders DO pose higher risks than first offenders
- However, those risks are not substantially greater and often not significant (statistically)

We conclude that first offenders should not be a protected class since many first offenders will go on to pose increasing levels of public risk.



A European qualitative field trial on interlocks

Peter Silverans, Marilys Drevet (IBSR, Belgium)

Javier Alvarez (UVA, Spain)

Terje Assum (TOI, Norway)

Claudia Evers (BASt, Germany)

René Mathijssen (SWOV, the Netherlands)

Introduction

In September 2003 the Directorate-General Energy and Transport of the European Commission granted funding for the project *Interlock implementation in the European Union: an in-depth qualitative field trial*. This project is investigating the subjective impact of interlocks on five small groups of about thirty interlock users in four European countries. Interlocks were installed in the vehicles of these drivers between September 2004 and February 2005. The combination of the data provided by the interlock data loggers and interviews of related subjects of these drivers will allow researchers to study the implementation of interlocks in a European context.

Objectives

As a starting point, the feasibility and practicality of interlocks as a general preventive measure for commercial drivers and as a specific preventive measure for offenders is being examined. This trial is not intended to evaluate the effectiveness of interlock devices but is instead intended as a first step towards large scale implementation of interlock programs. In an effort to examine the subjective impact of the interlock, measures are being collected regarding the psychological, sociological, behavioural, and practical impacts of these devices.

Design

The five different target groups include German truck drivers, Spanish bus drivers, Norwegian bus drivers, Belgian recidivist drink drivers and Belgian alcohol dependent patients. Interlocks are being installed in each of the target groups' vehicles for a 12-month period. The data that is being collected includes interviews with participants before, during, and after interlock use, datalogger records, and associated data pertaining to the implementation process. The commercial trials involving Spain, Germany, and Norway are somewhat different from the Belgian trials as the former, for example, do not involve running retests.

Update

Negotiations with local companies, politicians, and trade unions in Spain resulted in the installation of devices in December 2004. A transport company in Valladolid was selected involving 30 drivers and 15 interlock devices. Preliminary data show that there are no indications of drink driving history within the target group. The a priori attitudes of drivers towards the interlock during the pre-interview showed 17 positive results, 3 indifferent results, 2 negative results, and 8 with no opinion. The mean usefulness score (a score indicating how useful drivers think the interlock is) was .68; the mean satisfaction score (a score indicating the level of satisfaction drivers had regarding the interlock) was .41.



In Germany, several technical and organizational problems were encountered and, as a consequence, the installation of the devices was delayed until November 2004. Fifteen voluntary participants were identified in a large transport company; each of 19 drivers of a smaller transport company make up the mandatory group. Results of pre-interviews showed that 8 drivers had positive attitudes towards the device, 27 participants had neutral attitudes, and 5 drivers had negative attitudes. The mean usefulness score was .77 and the mean satisfaction score was .07.

In Norway the installation of interlock devices occurred in November 2004 due to negotiations with bus companies and the need for technical adjustments. Fifteen buses have been fitted with interlock devices and 30 drivers are participating in the study in Lillehammer. As in other jurisdictions, most drivers had positive attitudes towards the interlock devices, however, a few felt the device was unnecessary and problematic.

In Belgium the installation was delayed as well and the project was finally up and running by the end of 2004. Despite numerous efforts to include 30 alcohol dependent patients, only 7 patients agreed to participate in the field trial. There are 32 participants in the recidivist group. Collectively, the participating subjects form a heterogeneous group including 33 men and 6 women; 4 of them are younger than 30 years and 4 are older than 60 years. Almost all of them are recidivists but there are some first offenders too who were included based on high-BAC readings. Approximately 50% of the participants have an AUDIT-score higher than 8 and about 50% of them report having an alcoholic drink at least once per week. The mean usefulness score is 1.5 and the mean satisfaction score is .05.

Conclusion

The results of the project will be made public after analysis of all the data. As the last data will only be available by February 2006, the results can only be published in July 2006. This presentation is therefore limited to a description of the research purposes and the method of investigation. Some results of the a priori expectations of the participating drivers are also presented.

Acknowledgements

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Interlocks in Great Britain

Andrew Clayton¹ and Doug Beirness²

¹ RSN Associates, Birmingham, United Kingdom

² Traffic Injury Research Foundation, Ottawa, Canada

In comparison to many other jurisdictions, Britain has a relatively high legal limit but very severe sanctions on conviction. For example, a first time offender can receive a prison sentence of up to six months or up to 10 years if convicted of the more serious offence of causing death by careless driving under the influence of drink or drugs.

The role of alcohol in road crashes showed a downward trend until about the mid 1990s. Since then, the trend has been generally level but may now be rising. In 2002, around one in six road deaths occurred when someone was driving whilst over the legal limit.

The Road Safety Bill 2005, now on its passage through Parliament, provides for the establishment of alcohol interlock programmes.

Once approved, its effect is to give courts the power in certain circumstances to offer offenders the opportunity to participate, at their own expense, in an interlock programme. The provision applies to a person who is convicted of a relevant drink driving offence on a second occasion in a period of ten years and is to be disqualified for no less than two years. The period on the programme must be at least twelve months but must not exceed a half of the original unreduced disqualification period.

The programme requires the offender to comply with certain conditions. These include elements of education and counselling but a central feature is that the offender may drive only a car that is fitted with an interlock. If a person interferes with the device to try to prevent it from working he commits a new offence, and any failure to comply with the conditions of the programme will result in restoration of the full original disqualification period. The interlock device will be type approved by the Secretary of State and will be set at 9µg/100ml breath.

Where an offender agrees to and completes the programme, his/her overall period of disqualification may be reduced.

Initially, the programme will last for an experimental period, until 2010 or later if decided by the Secretary of State.

The present research project is a precursor to the introduction of interlock programmes for the experimental period. It has two principle objectives:

- 1) To examine the practicalities and social aspects of interlock programs, *and*
- 2) To investigate the acceptability of the interlock device to the user, *and* the impact of the device on the lifestyle of the user and other household members.

The programme has three phases. The first phase involved meetings with key stakeholders; the second is the demonstration project itself which is currently underway and the third is the process and impact evaluation.



Meetings with key stakeholders were important to ensure that they were knowledgeable about interlocks before any media interest was aroused.

Recruitment was a long and complex process designed to ensure that participants fully understood what they were letting themselves in for, thereby minimising the dropout rate.

The demonstration project itself is an 18 month longitudinal study using volunteers who are convicted drink driving offenders who have recently had their driving licence restored. They agree to an interlock being installed in their car for 12 months. They are monitored regularly (at 1-3 month intervals) and there is a final follow-up interview six months after the interlock has been removed. The test instruments measure alcohol use, driving habits and social issues. A control group follow a similar regime. The recruitment phase of the programme began in January 2005 and the fieldwork is due to end in December 2006.

Recruitment was a phased process to ensure that participants were fully aware of their obligations prior to entering the programme. Volunteers were recruited from two areas – North West England based on a service centre in Manchester and the West Midlands with a service centre near Birmingham. At the time of writing, recruitment was complete (88 interlock participants and 92 controls) and the early recruits have reached Month 9 of the programme.

On joining the programme, participants were asked how having an Interlock fitted in your car might help them. There were five main thoughts:

- a general ban on being tempted to drink and drive - "I would have it in my head that I would not be able to drive. Takes the temptation away."
- it will prevent people being caught the morning after – "It will get rid of the worry in the morning that I might still be over the limit".
- it will cut down on drinking, seen as a health benefit by some – "It would help my health because I wouldn't drink so much" and an economic benefit by others. Also helps when the car is needed the following day – "Wouldn't drink as much the night before to ensure I passed".
- it will educate about the elimination of alcohol from the body – "It will make me realise how long alcohol is in my system. Make me more responsible".
- it will prevent re-conviction – "I wish it had been fitted two years ago. It would have saved me a lot of expense & aggro".

And, also, as one participant pointed out, it has an added benefit – "It'll stop drunks stealing my car"! More seriously, one reply encapsulated what the interlock programme aims to achieve "I will obviously not attempt to drink & drive again. Hopefully after the year, habits will have changed so I will be able to drive without worries."

We can already see some of the effects of installing the interlock upon participants. A few just can't cope with them. They are those who are perhaps technophobes; certainly such people tend to panic easily and are embarrassed about being seen using the machines.

Then there are those for whom the interlock interferes with their normal drink driving habits too much. In other words, the interlock is doing its job effectively. Such people tend to want to continue to drink and drive. They then often rationalise their decision to opt out of the programme by, for example, blaming the interlock for failing to work properly.



The largest proportion of subjects are those who recognise that the interlock is interfering with their normal habits but are doing their best to modify their habits, either by drinking less if they have the car or by seeking alternative forms of transport if they want to drink. It will be interesting to see if it is possible to predict those who will maintain their changed behaviours after the interlock has been removed and those whose old habits will return soon.

And, finally, there are those who have already adapted and for whom the interlock has little effect. Such people changed their behaviour after their first drink/driving conviction. However, the presence of the interlock does provide that extra barrier to slipping back into old habits.

The previous slide described what effects participants expected the interlock to have on their drink driving behaviour. As we examine in more detail, the comments made in the bi-monthly interviews, we can gain some additional understanding of how their behaviour is changing.

As already mentioned, one of the key concerns is about being able to start the car the morning after a drinking session. Examples of two drinking strategies that are being adopted are stopping drinking earlier in the evening and secondly switching to soft drinks (e.g., cola).

Other participants are not modifying their drinking behaviour but changing their driving behaviour. Walking to the local pub or using public transport (bus, train, tram or taxi) to visit the nearest city are common strategies. Alternatively, a partner may be persuaded to act as chauffeur or they rely on friends to collect and return them. Interestingly, when a partner is mentioned, it is usually stated that he/she is a non-drinker. No such qualification is normally given when describing lifts from friends. There is some concern, therefore, that, despite their conviction, some participants are still willing to be driven by someone who has been drinking.

Some other issues have also arisen. In general, participants are unhappy about stopping to provide rolling retests. They are perceived as too frequent and an unnecessary irritant. Finding a safe place to stop on Britain's crowded road network is not always easy.

Other participants have complained about having to provide a sample after filling the car with fuel at a service station. Some see it as embarrassing having to do this whilst the car in the queue behind waits to draw up to the pumps. "In a queue at busy petrol station it's a bit embarrassing as you hold people up."

All participants are instructed to disconnect the sampling head and keep it in the house overnight. Many still complain about the time taken by the machine to warm up in the mornings. "In morning a bit of a nuisance - takes too long, breath test a problem, sometimes takes more than once."

The reactions of friends and family are many and various. Examples of reactions to children seeing it include "sometimes when I pick up my daughter's school friends they want to know what the device is so I feel I have to explain which I find quite embarrassing especially when I have to blow into it." and "The kids know what it is and tell all their friends at school. They've all had a try to blow into it."

Political and public opinion seems generally in favour of their introduction although concerns remain about the robustness of the technology and the problem of persons other than the driver providing the breath system.



We are now about half way through the research – far too early to formulate any conclusions. It may, however, be worth considering the context in which interlocks are introduced into Britain. Are they being introduced as a punishment or as an aid to helping people break the Gordian knot of drinking and driving? To what extent does the Government wish to encourage their use within the judicial system? In simple terms, how attractive an option should interlocks be? Attractive in terms of their cost, their availability (ease of access to installation and service facilities) and the trade-off against the period of disqualification.

We hope that the research findings will provide some data to help answer such questions.



Australia's major interlock program

Philip Swann
Vic Roads
Victoria, Australia

The Interlock Program in Victoria, Australia has grown since the first interlock was installed in a vehicle in May 2003. After 6 months, 81 interlocks had been installed and after 2 years more than 2,800 interlocks have been installed. Currently approximately 1,600 drivers are using interlocks, and it is anticipated that this program will increase to 8,500 interlocks with existing initiatives.

This program is mandatory and interlocks are required in addition to other existing penalties, education and rehabilitation programs. Interlocks are not offered in lieu of other penalties. The removal of interlocks is decided by the Courts.

The pre-set threshold BAC is 0.02g/dl and VicRoads is the administering agency, which is responsible for approving interlock devices, interlock suppliers, and the providers of installation and maintenance services for these devices.

Currently, interlock approvals have been given to the WR2 Alcohol Ignition Interlock and the Dräger Interlock XT and interlock supplier approvals have been given to Guardian Interlock Systems Australasia Pty Ltd and Dräger Safety Pacific Pty Ltd.

Interlock devices should meet the specifications outlined in the Australian Standard 3547, which covers accreditation, anti-circumvention features and data recording requirements. The interlock device should record data on driver details, date and time of all breath tests, all BAC readings, all power and handset disconnections, all vehicle starts without a breath test and all failed/ignored retests.

The Government has published Guidelines for the approval of interlock suppliers and these cover resources, accessible service facilities, complaints mechanisms, QA systems and concessions. The Guidelines also detail the installation and service requirements concerning labeling, data downloading, summary reports, retention of reports, and liability for repairs.

At present interlocks are mandatory for all repeat offenders. The installation period varies from minimum periods of 6 months to 3 years depending on the nature of the offence. Interlocks can also be ordered at the Court's discretion for first offenders who have committed an offence where the BAC was at least 0.15g/dl or a non-BAC offence such as a DUI or a refusal to supply a breath sample or blood sample.

To obtain an interlock license, the driver must complete the disqualification period before applying to the Court for a License Restoration Order. If the request is granted, VicRoads issues a license with an interlock condition. The driver must only drive a vehicle fitted with an interlock device.

The interlock condition is imposed in addition to a clinical assessment and treatment program as well as a driver education course. An important feature of the program is that drivers must also go back to the court to get an interlock condition removal order (ICRO) before the interlock device can be removed. The court has available a report on the driver's performance on the interlock, which can be considered in the decision to remove or extend the interlock license



condition. Removal is not automatic and the Courts have refused to grant removal orders to approximately 2% of drivers.

Approximately 70% of drivers who have been granted “Interlock licenses”, have had fitted an interlock to their vehicle. More than 99% of drivers, who have had interlocks fitted, have continued with the Program and less than 1% have withdrawn.

In the last 18 months additional legislation has been passed to extend the discretion of Magistrates to increase the number of drivers eligible for the program.

Potential circumvention is addressed by several factors, particularly the requirement for the driver’s interlock performance to be provided to the Magistrate for consideration, when making a decision on whether to remove an interlock, or extend the interlock period. Drivers must provide a “compliant” record of their use of the interlock, to demonstrate that the interlock device can be safely removed.

Penalties for circumvention include fines up to \$3,000, imprisonment up to 4 months or vehicle immobilization for up to 12 months. Also attempts to circumvent the operation of the interlock are discouraged by drivers having to pay additional charges for 7 day recall events. Financial incentives for program compliance include extension of service events from monthly to 2 or 3 months, if there are no circumvention attempts or misuse after the first monthly service.

The Victorian Police performed approximately 3,658,000 alcohol screening breath tests in 2004, and there are approximately 4,000,000 “relevant” license holders. Alcohol screening tests that show illegal BAC levels are followed by Police Evidentiary Tests and 27,545 such tests were performed in 2004. Approximately 8,000 drivers had previous alcohol driving offences. About 34% of all recidivists had been driving either “unlicensed” or “disqualified” or “suspended” and it is anticipated that these drivers will not fit interlocks. Of the 66% of recidivist drivers who could be expected to regain a license, on current trends only 70% will fit an interlock. Thus the current program should grow to approximately 4,000 interlocks.

In addition, the Government has released a “Young Driver Safety and Graduated Licensing” discussion paper which highlights the high risks and high incidence of drink driving. In Victoria, half of the drivers aged 21 to 25 years who are killed have a blood alcohol reading exceeding the 0.05g/dl BAC legal limit. To tackle this issue a program of mandatory fitting of alcohol interlocks for all drink driving offenders aged 25 years or younger for a minimum period of 6 months has been presented. This would increase the number of interlocks by approximately 4,500.

To reduce the incidence of drink driving road trauma, the number of interlocks being used by “at-risk” drivers should be increased. The number of such drivers currently using interlocks in Victoria is approximately 1600 and this is expected to grow to 4,000 under current laws and to 8500 with the Young Driver initiative.

New South Wales has also been operating an interlock program for 2 years and has about 280 interlocks in use, whilst South Australia has been operating a program for 4 years and has about 100 interlocks in use.

Although the individual state programs differ significantly, road safety in Australia is coordinated nationally and once an initiative is shown to be successful in one state then it is generally



adopted in other states (national actions can be used to expand the effective initiatives to all other states).

Currently the Victorian program is being reviewed and in the future an “effectiveness” evaluation will be done. With the predicted growth in the numbers of Victorian interlocks it could be anticipated that the reviews will demonstrate measures of program success. This would then lead to the other 6 states and territories also implementing larger programs.

The costs to the drivers who must use interlocks have not been reduced since the program commenced and the choice of interlocks remains as either the Guardian WR2 or the Dräger XT device. The degree to which this impacts the program will be assessed in the current review.



Experimentation of interlock devices in a selected population of drivers involved for DUI in France

Charles Mercier-Guyon
Prévention Routière Association

Michel Mallaret
President of the National Commission of Psychotropic Substances

Philippe Drouet
Prosecutor of the Justice Court of Annecy
Annecy, France

Introduction

There are a total of 60 million inhabitants in France and approximately 6,000 fatalities per year. It is estimated that 30% to 35% of these fatalities are related to alcohol. Of approximately 7 to 8 million alcohol tests that are conducted annually, 181,000 are in excess of the legal limit of 0.05 g/dl.

Drink driving constitutes an alcohol-related offence and is defined as part of a tiered system consisting of two separate levels. Drink driving with an alcohol concentration of at least 0.05g/dl, but less than 0.08g/dl can be punished with a fine and/or a penalty equal to 6 driver license points. An alcohol concentration of at least 0.08g/dl is punishable with a fine up to €4,500, a maximum of 2 years incarceration, a maximum 3 year suspension of the driver's license, and the possible cancellation of the license for offences involving injuries or fatalities or other designated offences. Penalties may also include a penalty equal to 6 driver license points.

There is also a range of suspensions of the driver license, including a 72 hour suspension administered at the roadside by police, an administrative suspension determined based on a scale linked with the blood alcohol concentration that is ordered by the prefect (judicial representative), and a suspension or revocation that can be ordered by the court.

An experimental interlock program

An experimental pilot interlock program has been implemented in France. This program offers offenders the opportunity to drive with an interlock as an alternative to penal sanctioning. The public prosecutor assumes authority over alternative sanctions and thus decides whether driving with an interlock is an appropriate sanction or not. The project is led by the Road Safety Association of Haute-Savoie.

Methodology

This pilot program is based on the voluntary participation of offenders who pay €1,260 for the program. Following two days of training relating to the prevalence of alcohol in accidents, the effects of alcohol on the body, and traffic safety, the offender enters the program which is 6 months in length. The two service providers involved in this project are Alcohol Countermeasure Systems and Dräger.

The inclusion criteria for the program include: being a first offender with a breath alcohol concentration of at least 0.08g/dl but less than 0.18g/dl; having a driver's license for at least 3



years; being younger than 65 years; not being a heavy drinker or using illicit drugs; not being an occasional drinker. A medical examination prior to entry into the program is required.

The threshold of the interlock device is programmed to lock out the starter system of the car at a breath alcohol concentration of 0.015mg/l. Data is downloaded every month or every other month. Incidents are managed within 5 days and a final report is sent to the prosecutor.

Results

Of those offenders included in the program, 88% of the participants are male and 12% are female. Most of the participants are in the 31-40 and the 21-30 age categories. Age categories 41-50 and 51-60 are also well represented. Participants who are older than 60 are clearly a minority group within the program.

To date, no major program violations have been recorded. One participant has been excluded from the project for external reasons. A majority of the breath test failures (85%) were detected during the first 2 months. To date, all participants (100%) have demonstrated positive attitudes toward this project at the completion of their interlock period while 90% of the control team reported a positive attitude.

Conclusion

The project is up and running. A total of 200 devices are expected to be installed before December 2006. The project will be enlarged geographically to include other jurisdictions and courts. A new law is forthcoming and the training package will become the core of the program.



A commercial interlock field trial in Canada

Ian Marples

Alcohol Countermeasure Systems, Inc.

Mississauga, Canada

Introduction

In the past decade, there has been a growing interest in interlocks for commercial drivers for two primary reasons. Interlock programs can be conceived as part of a risk management strategy and as a productive way for companies to establish a commitment to safety. In Sweden, several thousand interlocks are installed in a variety of commercial vehicles. New regulations will soon require all commercial cars and light trucks to install interlock devices, and the government is proposing to require interlocks on all buses and trucks by 2010. As part of the European interlock project, the installation of commercial interlocks in trucks in Germany and in buses in Spain and Norway has begun. The European project is examining how commercial interlocks influence behavior and attitudes and its results will help shape quantitative studies that are seen as a precursor to legal implementation. The results are also expected to influence how commercial interlock technology is developed and used. The Canadian and US experience with commercial interlocks is more limited, but expected to increase in the future.

Purpose

The aim of this project is to add a North American dimension to existing research and to demonstrate the efficacy of commercial interlocks in this context. The purpose is to study the impact of alcohol interlock technology on behavior and attitudes -- not to catch drinking drivers. The approach is based on applying the design and methodology of the European Interlock project to a North American setting.

Methodology

The study will be conducted as an in-depth qualitative field trial, focusing on self-reported impact in comparison with logged data. The field trial will run for one year and data will be collected after 1, 6 and 12 months. Self-selection bias will be reduced by including all drivers and managers of participating companies/branches.

In each phase a questionnaire will be administered exploring attitudes and behavior patterns in relation to drinking, driving, and the combination of these activities. There will be a supplementary probing of circumstances and motivations in the event of non-compliance (e.g. failed breath test). The interlock records data relating to the use of the interlock device and the vehicle, including date, time of day and alcohol level (if any) every time a breath test is taken.

Participants will be guaranteed anonymity from each other, from the research analysts and from their employer and the confidentiality of participants will be assured. At no time will any personal identifiers be attached to any of the information recorded, transmitted, analyzed or reported. Such a guarantee, however, does not mean that a participant who fails a breath test will be immune from any negative consequences. If the interlock detects alcohol, it will not allow the vehicle to start, which will, in turn, prevent the participant from carrying out his/her job. This may lead to negative consequences for the employee. There are also potential legal consequences in the event that a failed test is associated with the commission of an offence contrary to



provincial and/or federal laws. However, beyond the anonymity guarantee, the employer has given their assurance that participants will not be subject to disciplinary action based solely on breath test results. Finally, employers are prepared to offer constructive assistance without recrimination to any participant who, at any point during the study, thinks he may have a problem with alcohol that should be addressed.

Preliminary Results

Preliminary results indicate that the group of participants is diverse with regard to drinking patterns, particularly in terms of frequency of drinking, quantity of drinking and driving after drinking. Final results are expected in time for the 7th Annual Ignition Interlock Symposium.

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Participants in the study are employees of Vanfax®, the wholesale distribution division of Belron Canada Inc., a leading Canadian distributor and retailer of auto glass and electronic automotive products.

Research expertise is provided by Dr. Doug Beirness.



The Insurance Industry and Interlocks: A Win-Win Partnership

Barry Sweedler
Safety and Policy Analysis International, L.L.C.
Lafayette, CA

Introduction

Alcohol ignition interlocks appear to be an effective way of reducing recidivism among some groups of impaired driving offenders. They also reduce alcohol related crashes among these drivers and therefore the human and economic costs associated with these crashes. Interlocks are, however, used in only a small percentage of the eligible cases. This presentation will discuss ways that the insurance industry could provide incentives for more widespread use of interlocks. The presentation will summarize briefly how automobile insurance rates are set in the United States, examine how a DUI offense affects a driver's auto insurance rates, discuss some initiatives from other countries, and look at possible reasons why an insurance company would offer a discount incentive to its DUI offender customers as well as some of the impediments to doing so.

How a DUI offense affects a driver's auto insurance

The rate a person pays for car insurance depends on how risky they appear to the insurance company offering the policy. If a driver's insurer finds out about a DUI offense, higher rates and possibly policy cancellation or non-renewal are likely. For those drivers who cannot obtain auto insurance coverage on the open market, U.S. states have what is known as the "assigned risk pool" — a state-run system that forces all carriers to share the burden of insuring the riskiest drivers. Premiums in assigned risk pools run 50% higher on average than with private insurers, according to Robert Hunter, director of insurance for the Consumer Federation of America (*Smart Money Magazine* 2002).

Why would an insurance company offer an interlock discount?

In its 2001 report on alcohol ignition interlock devices, ICADTS noted that evidence spanning nearly ten years by 8 or more research groups in the U.S. and Canada point toward 40-95% reductions in recidivism while the interlock programs are in effect relative to DWI rates of matched groups of offenders who are simply suspended and should not be driving at all (ICADTS 2001). The U.S. States and Canadian Provinces studied were: Ohio (Elliot & Morse 1993); Oregon (Jones 1993); North Carolina (Popkin et al. 1988); Alberta (Weinrath 1997 and Voas et al. 1999); West Virginia (Tippetts & Voas 1998); Maryland (Beck et al. 1999); and Québec (Vézina & Dussault 2001).

One of the studies mentioned above (Beck et al. 1999), should have particular influence on an insurance company's decision to offer a reduction to a driver while the interlock is installed on their vehicle. The study was funded by the Insurance Institute for Highway Safety (IIHS), a highly respected research group funded by the U.S. insurance industry. The research was conducted by the University of Maryland to find out if ignition interlock devices reduced the recidivism rate of repeat violators of drinking-and-driving laws. For the study, Maryland researchers used a sample group of 1,380 repeat offenders of drinking-and-driving laws who



had received treatment and were eligible to have their driving privileges reinstated. They randomly assigned members of the group to either a continuing treatment program or a treatment and interlock program. Offenders participating in the interlock program received restricted licenses allowing them to drive a vehicle only if it were equipped with an ignition interlock.

Results reported a year later revealed that only 2.4 percent of those repeat offenders assigned to the interlock program had committed an alcohol-related traffic violation. The violation rate for the control group was 6.7 percent. Kenneth Beck, one of the researchers and a professor of health education at the University of Maryland, reported, "This was a statistically significant difference and indicated that being in an interlock program reduced the risk of an alcohol traffic violation within the first year by about 65 percent" (IIHS 1997).

Existing insurance incentives for installing the interlock

Examples of insurance company incentives for installing interlock devices are found in North America and Europe.

Quebec has a public no-fault insurance plan which covers personal injury claims resulting from traffic crashes. Private insurance companies in Quebec do offer coverage for drivers but only for vehicle property damage claims. One private company, La Capitale assurances générales inc. (La Capitale General Insurance Inc), offers its existing property damage customers who are convicted of an impaired driving offence for the first time a 100% waiver of the premium surcharge that would otherwise be applicable, providing they participate in the interlock program for at least 12 months. For existing clients who are convicted of a second impaired driving offence, a 50% waiver is offered. La Capitale's offer has been in place since 1998 (shortly after the commencement of Quebec's Ignition Interlock Program) (Marples 2004).

In Sweden, a 50 percent reduction in the portion of the insurance premium that covers the vehicle is offered by one insurance company to drivers who install an interlock device (Lonegren 2004).

A private insurance company in West Virginia in the U.S. offered a program to reduce rates if an interlock was installed, but then abandoned it when it did not prove popular among offenders. (ICADTS 2001).

While the insurance described above would appear to provide significant motivation for offenders to participate in interlock programs, the programs are undersubscribed. The reason for the lack of offender participation is not known and would need to be remedied if the insurance industry is to play an important role in facilitating the adoption of interlock programs.

What the insurance industry could do and what are the impediments

Providing incentives to increase interlock use would seem like a win-win situation for the insurance industry, their customers and for traffic safety. Since interlocks have been proven to be effective in reducing recidivism while they are installed on an offender's vehicle, it would make sense for an insurance company to offer a reduced rate to any of its customers who received a DUI and then installed the device. Usually, a driver's insurance premium is significantly increased after a DUI offense. If a company would offer a reduction, at least as large as the cost of the interlock, it could serve as a major incentive for DUI offenders to install



the interlock. It could be expected that many more DUI offenders would opt for the interlock and therefore become a legally licensed driver with appropriate automobile insurance. Greater use of the interlock would result in fewer alcohol-related crashes, fewer injuries and fewer fatalities. This would result in lower claims and lower costs to the industry.

It is important to understand the advantages and disadvantages insurance companies must consider before they take this kind of action. Note that for the last five years, auto insurance companies on average have not made profits on the policies they have written. In other words, for every dollar in premium collected, they have paid out \$1.04 in expenses. In general, most auto insurance companies do not make an underwriting profit and instead rely on profits from investments made using the capital generated by premiums (Best 2002). If rates are reduced, then insurance companies will have less money to invest and therefore, their profits will be lower. Skeptics might say that insurance companies are not really interested in reducing crashes, because fewer crashes mean lower costs which result in lower insurance rates. Lower rates mean less money to invest.

Government agencies could take a role in encouraging insurance incentives. In the United States, the rates that insurance companies charge their customers are regulated, to varying degrees, by state insurance commissions. In some states, the rates are actually set by the state. It is possible that insurance regulators or even state legislatures could impose requirements for insurers to offer a rate adjustment based on the installation of an interlock device. There have been instances when regulators have required adjustments, such as with the discount offered to seniors who take driver education.

In three Canadian provinces, Quebec, Saskatchewan, and British Columbia, the provincial government issues automobile insurance. In these instances, the government-sponsored insurance carriers might be in a good position to provide incentives for interlock use in order to improve traffic safety.

Insurance companies could provide other types of motivations for participation in interlock programs. For example, installation of interlock devices could also be required as a condition for a driver to be offered a policy under a state's "assigned risk pool" program.

A significant impediment to insurance company participation in interlock incentives is the question of whether risks and costs are actually reduced by the use of interlocks. In a study conducted in Quebec (Vézina 2002), it was found that while people in the interlock program had fewer alcohol related crashes, they had more total collisions than those who were not in the interlock program but under license suspension. The increased risk of collision (other than alcohol related) was probably due to increased exposure, that is, interlock participants drove more because they could regain their licenses earlier than those that did not obtain an interlock. Unlicensed drivers pose a higher risk. For example, breath test results showed that 17% of disqualified drivers who were breath tested after an accident were positive compared with the national average for all post-crash tests of 3%. (McMahon 2005).

The question then becomes: is it expected that a reduction of alcohol-related collisions has a greater overall benefit when factoring in the increase in overall collisions resulting from increased exposure. The authors of the Quebec study did not have the individual exposure data necessary to study that outcome. However, on a miles driven basis, the authors believe that the number of collisions is lower for drivers in the interlock program compared to drivers not in the program (Vézina 2005).



A more recent series of evaluations of various California ignition interlock device programs was completed in 2004. The studies looked at interlock programs imposed by a judge as part of court proceedings and those imposed through an administrative process. These evaluations indicate that the interlock programs were effective in reducing alcohol related crashes and convictions for some offenders. For the most part, they increased overall crash rates. It should be noted, however, that while overall crash rates were higher than for offenders who were not on the interlock (and presumably unlicensed), the crash rate was still slightly below that of average California drivers (DeYoung, Tashima and Masten 2005).

The bottom line for insurers, both public and private, is the overall effect on risk for drivers in the interlock program. Based on the California experience, it might be possible for insurance companies to provide premium relief for interlock use to their customers who become DUI offenders, but also fall in that group of drivers that not only have fewer DUI convictions and incidents, but also have fewer overall crashes. If it can be shown that the overall risk and subsequent claims are reduced for drivers in the interlock program, then financial incentives could be expected to be offered to drivers to enter the interlock program.

References

- Beck, K., Rauch, W., Baker, E., & Williams, A. (1999). Effects of ignition interlock license restrictions on drivers with multiple alcohol offenses: A random trial in Maryland. *American Journal of Public Health*. 89, 1696-1700.
- Best's Aggregates & Averages - Property/Casualty - United States & Canada, 2002 Edition, www.ambest.com.
- DeYoung, D. J., Tashima, H.N. and Masten, S.V. *An Evaluation of the Effectiveness of Ignition Interlock in California*, California Department of Motor Vehicles, presentation at the 84th Annual Meeting of the Transportation Research Board, Washington, D.C., January 11, 2005
- Elliot, D. S., & Morse, B. J. (1993). *In-vehicle BAC test devices as a deterrent to DUI*. (Final Report). Washington, DC: National Institute on Alcohol Abuse and Alcoholism.
- International Council on Alcohol, Drugs and Traffic Safety, *Alcohol Ignition Interlock Devices 1: Position Paper*, P. Marques (Ed), 2001, www.ICADTS.org.
- IIHS *Status Report*, May 10, 1997, Insurance Institute for Highway Safety, Arlington, VA.
- Instant Auto Insurance Quotes, 1035 Suncoast Lane, Suite 130, El Dorado Hills, CA 95762, www.123-instant-auto-insurance-quotes.com.
- Insure.com (2002), *How a DUI conviction affects your insurance*, <http://info.insure.com/auto/autosave.html>, July 3, 2002
- Jones, B. (1993). The effectiveness of Oregon's ignition interlock program. In H.D. Utzelmann, G. Berghaus, & G. Kroj (Eds.). *Alcohol, drugs and traffic safety – T-92: Proceedings of the 12th international conference on alcohol, drugs and traffic safety, Cologne, 28 September – 2 October 1992*. (V.3, pp. 1460–1465). Köln, Germany: Verlage TÜV Rheinland GmbH.
- Lonergren, B. Presentation at the 5th Annual Ignition Interlock Symposium, Phoenix, Arizona, October 24-26, 2004, www.ignitioninterlocksymposium.com.
- Marples, Ian R., Director, Planning & Development, Alcohol Countermeasure Systems Corp., Mississauga, ON, Canada, personal communications on December 15 and 17, 2004.



- McMahon, Kate, Divisional Manager, Road Safety Strategy Division, Department of Transport, Great Britain, personal communication on January 6, 2005
- Popkin, C. L., Stewart, J. R., & Lacey, J. H. (1988). *A follow-up evaluation of North Carolina's alcohol and drug education traffic schools and mandatory substance abuse assessments*. (Final Report). Chapel Hill, NC: University of North Carolina, Highway Safety Res. Center.
- Quaye, Kwai, Saskatchewan Government Insurance, Canada, personal communication on January 7, 2005
- Smart Money Magazine*, www.smartmoney.com
- Tippetts, A. S., & Voas, R. B. (1998). The effectiveness of the West Virginia interlock program. *Journal of Traffic Medicine*, 26(1–2), 19–24.
- Vézina, L. Société de l'assurance automobile du Québec, Canada, personal communication, January 7, 2005.
- Vézina, L. The Québec Alcohol Ignition Interlock Program: Impact on Recidivism and Crashes, In: *Proceedings of the 16th International Conference on Alcohol, Drugs and Traffic Safety*, D. Mayhew and C Dussault (Eds), Montreal, Québec, Canada, August 2002.
- Vézina, L. & Dussault, C. (2001). Programme d'antidémarrreur: Impact sur la récidive et les accidents au Québec. Société de l'assurance automobile du Québec, Canada.
- Voas, R.B., Tippetts, A.S., Marques, P.R., Beirness, D.J. (Dec 1999). The Alberta interlock program: Evaluation of a province-wide program on DUI recidivism. *Addiction*. 94(12), 1849-1859.
- Voas, R. B., & Tippetts, A. S. *Unlicensed driving by DUIs—A major safety problem? TRB ID No.: CR077*. Paper presented at the 73rd Annual Meeting, Transportation Research Board, Washington, D.C., January 9-13, 1994.
- Weinrath, M. (1997). The ignition interlock program for drunk drivers: A multivariate test. *Crime and Delinquency*, 43(1), 42–59.



Are there Ways to Establish Interlock Programs in Germany?

Simone Klipp

Ernst-Moritz-Arndt University, Department of Psychology

Section: Social Psychology/ Work & Organizational Psychology

Greifswald, Germany

The introduction of alcohol interlocks is being discussed more and more in Germany. Since the Federal Traffic Authority granted general permission to Dräger-Interlocks on December 18th 2001, the implementation of interlock programs and voluntary installation on an individual basis has become possible. But the implementation is still far from being achieved due to a lack of incentives for voluntary installation (e.g. a reduction of insurance fees is refused by several insurance companies). Legislation mandating all vehicles be equipped with interlocks conflicts with elements of the German constitution -- more specifically, it would breach "the principle of proportionality". Therefore interlock devices can only be used as a special preventive measure (e.g., for the high risk group of DUI offenders). A detailed analysis of the German legal system, especially regarding specific legal issues, Germany's legal practice, and how DUI offenders are currently dealt with, could help overcome this limitation.

The German law on DUI offences differentiates between misdemeanours according to the Traffic Road Act and felonies according to the Criminal Law. A DUI offence with a BAC from 0.05g/dl up to 0.109g/dl is defined as a misdemeanour. The offender is banned from driving for a period of one to three months as a disciplinary punishment. During the driving ban the driver's license is held in legal custody by the competent administrative authority and is automatically returned to the driver following the ban period.

The procedure for DUI offences involving a BAC over 0.109g/dl is different. According to §69 StGB [Criminal Law] such DUI offences are penalised by a withdrawal of the driving license through a valid legal judgement or a judicial decree. The retention period is measured according to safety and improvement, not punishment. The minimum duration of the period is six months and may last up to 60 months. The driving license is returned to the delinquent only after a proper application to the competent administrative authority.

Germany thus has two different authorities: the court (responsible for the withdrawal of the driving license) and the administrative authority (competent for reinstating the driver's license as well as withdrawal under special circumstances). It is not possible for the court to impose an alcohol interlock restriction for the offender because legislation does not exist in criminal law. The only opportunity to impose such a restriction would be when the delinquent applies for a new driving license. The competent administrative authority would then issue a new driver's license with a restriction for driving only an interlock-equipped vehicle.

The prevailing system, however, provides other measures and is considered to be 'very effective'. Currently, before the driver's license is reinstated, the competent administrative authority has to check the driver's aptitude. If there is reasonable doubt about the driver's aptitude, which is always the case when the offender scores a BAC over 0.159g/dl or in cases of repeat DUI offences, the administrative authority will order a Medical Psychological Assessment.

The Medical psychological Assessment consists of three different phases:



- First, a medical examination is ordered to identify indicators for current alcohol abuse, including screening of the blood using common biological markers (GGT, GOT, GPT, MCV, the CDT-assessment is an unsolicited order);
- Then, the subject's psycho-physiological capabilities are tested;
- Finally and most importantly, a qualified psychologist explores the subject's drinking behavior in the past, present and future and checks its reduction and its stability.

The Assessment results in one of three possible conclusions. The first possibility is a positive result (in 40% of the cases), confirming the driver's aptitude and predicting legal and non-alcoholic traffic participation in the future. The second possibility is a negative conclusion (drawn in 45% of cases). All subjects with a negative test result have to continue being assessed until they achieve either the former or the latter result. The third possibility is a recommendation for attending a qualified and especially accredited training program, which is the case for nearly 15% of the subjects. After successfully completing this training course, the offender's driver's license is reinstated.

The Medical Psychological Assessment typically leads DUI offenders into the rehabilitative system and different programs exist in Germany. On the one hand there are programs to reintegrate general traffic violators (e.g. exceeding speed limits...). On the other hand there are three kinds of programs for DUI offenders:

- Programs for novice drivers who exceeded BAC-limits over 0.05g/dl or drove under the influence of other drugs;
- §-70-Training Courses ordered and based on individual expertise after the Medical Psychological Assessment;
- Voluntary programs to improve the chances of passing the Medical Psychological Assessment or to reduce the retention period.

Based on results of a previous study, our research group identified the weak points of the current rehabilitation system. These include the following:

Interventions start too late -- typically the intervention starts after the failed Medical Psychological Assessment and no earlier than 12 months after the DUI offence in question. This leads to the long-term loss of mobility and an escalation of problems like long-term unemployment. Furthermore, participation is mostly mandatory, taking place in a repressive context, which does not necessarily motivate the client. Additionally, many drivers do not attend any rehabilitative program due to a lack of problem awareness and because the incentives for early participation are not communicated (e.g. the possibility to shorten the retention period according to § 69a (7) StGB [Criminal Law]). Moreover, the rehabilitation programs are often expensive and thus only certain delinquents can afford to participate. In addition, a contributing factor is the lack of a well-developed service network. In light of these multiple issues, our research group developed ideas and strategies to improve the German rehabilitation system.

Currently there are two interlock projects in the preparatory phase. First, there is a pilot project for the area of Mecklenburg-Western Pomerania, an enlargement and improvement of the approved Greifswalder Model "FIBS" (**F**rüh**i**ntervention **b**ei **S**traßenverkehrsdelinquenz = early intervention in traffic delinquency). The second project will be conducted by PRONON, a German-wide association for drunk driver rehabilitation. For a detailed description see the comparison of the projects listed in table 1 below.



Table 1: Comparison of two Forthcoming Alcohol Interlock Projects in Germany

| Project | FIBS | PRONON |
|--|---|---|
| Aims | <ul style="list-style-type: none"> • Avoidance of a long-term-loss of mobility • Identification of determinants for successful participation • Exploration of new opportunities in criminal policy | <ul style="list-style-type: none"> • Evaluation of the success of an individualised extended personal intervention in combination with an interlock • Guarantee of alcohol-free traffic participation |
| Sample | <ul style="list-style-type: none"> • Every DUI offender with a BAC above 0.11g/dl in Mecklenburg-Western Pomerania who is motivated to participate - <i>No concrete elimination criteria</i> | <ul style="list-style-type: none"> • DUI offenders with a BAC between 0.16g/dl – 0.20g/dl <p><i>Elimination criteria:</i></p> <ul style="list-style-type: none"> - Multiple DUI-offences or other traffic felonies in the past - Alcohol Dependence |
| Procedure - Recruitment | <ul style="list-style-type: none"> • A “coordinating body” invites every DUI offender to free of charge counselling <u>within four weeks of the offence</u> • By counselling the offenders are <u>informed, screened and referred to an adequate treatment</u> (brief or extended intervention) | <ul style="list-style-type: none"> • <u>After expiry of the retention period</u> the delinquent is screened for suitability for the project according to the previously mentioned elimination criteria • If considered to be suitable, <u>PRONON offers an extended individualised personal intervention</u> in combination with an interlock |
| - Court Issues | <ul style="list-style-type: none"> • Engaging in and successfully attending the adequate program + installation of an interlock - Application to the competent court according to § 69a (7) StGB for a reduction of the retention period | None |
| - Administration | <p>If the retention period is reduced, there are two possible cases:</p> <ul style="list-style-type: none"> • BAC 0.11g/dl – 0.159g/dl & no further DUI-offences - driving license without any restrictions • BAC over 0.159g/dl: - See PRONON-procedure | <ul style="list-style-type: none"> • The competent administrative authority determines whether the offender has to pass the MPU (as usual) or is granted a driving license with restriction |
| - Course | <ul style="list-style-type: none"> • The offender has to successfully complete the adequate treatment he was referred to at least for six months, while a check of blood screening markers is obligatory every six weeks | <ul style="list-style-type: none"> • The offender receives an extended individualised personal intervention by a PRONON therapist |
| - Completion | <p>After six months of driving with an interlock and fulfilling all success criteria:</p> <ul style="list-style-type: none"> • Offer to uninstall the interlock (in cases of restricted driving license probably through an MPU) • Or voluntary offer to continue driving with the interlock | <p>After successful completion of the extended personal intervention:</p> <ul style="list-style-type: none"> • Application to the competent administrative authority to cancel the restriction - MPU with positive result - non-restricted driving license |



Finally, the problems that could potentially occur in the course of the procedure need to be mentioned. The most important factor by far is the necessary political and administrative support. Currently, the issues are being discussed with the Ministry of the Interior and the Ministry of Justice in Mecklenburg-Western Pomerania. Further problems include financial aspects. Participating in one of the explained programs will involve high costs for the delinquents and likely exclude those suffering financial hardship. This is, of course, not in accordance with the program's objectives. The current law only offers limited possibilities to prevent non-compliance, and legislation authorizing a criminal prosecution in non-compliance cases does not exist. If these obstacles can be negotiated, however, the pilot projects may contribute to optimizing driver rehabilitation in Germany.



Interlocks in Finland

Janne Mänttari

**Traffic Safety Unit, Ministry of Transport and Communication
Helsinki, Finland**

Drink driving is one of the largest traffic safety problems in Finland. Almost one-quarter of all fatal road accidents involve alcohol. In 2004 the police reported 27,000 DWI cases and in 2005, 0.15 % of drivers had a BAC level above the legal limit (0.05g/dl).

In July 2005 Finland began a 3-year national interlock offender program to test new measures to reduce drink driving. The program is voluntary in nature and is an alternative to a hard suspension period. There is no fixed BAC level requirement, but offenders are denied participation if drugs have been detected. The interlock can be installed in a car or van for a fixed one year period. The program also includes a rehabilitation program that lasts for the entire year and requires a reduction in alcohol consumption. Failure to comply with the rules of the rehabilitation program will result in removal from the interlock program. Other traffic violations, such as speeding, or interlock manipulation can also be reasons for removal. Both Alcohol Countermeasure Systems and Dräger are service providers for Finland. In the future Finland plans to make interlocks mandatory for at least multiple DWI offenders and a long-range target is to have an interlock device in every new vehicle within ten years.

Finland is also beginning to promote interlocks in commercial transportation. At the moment there are interlocks in some driving schools and taxi companies, but the potential application is much larger than the voluntary offender program. In 2006 a small scale trial will most likely be organized in order to enhance awareness and acceptance in transportation companies. There are also plans to introduce interlocks into municipal commercial traffic purchase regulations, which would mainly effect school transportation and road maintenance vehicles. The political will to demand interlocks especially in school transportation and transportation of hazardous goods already exists. Consequently, the broader implementation of interlock devices could become a reality in as little as five years.



From research to practice: trials, tribulations and a few reality checks

Melanie Hands
Consultant, Office of Road Safety
Perth, Western Australia

Introduction

Alcohol interlock schemes the world over continue to be implemented in ways which fail to deliver optimum results and drink driving continues to take an unacceptable toll on our roads. This is despite a significant body of research related to implementing alcohol interlock schemes and the development of best practice principles to guide program design.

The key questions to be asked then, are why are interlock schemes continue to be implemented in ways that fail to achieve their full potential and what more do we need to know in order to address this problem? Recent experience in Western Australia (WA) may provide some answers to these questions.

In 2003, an expert working group reviewed the issue of repeat drink driving in WA and proposed a comprehensive strategy to reduce drink driving and the related harm to the community. The strategy drew strongly on the available research, international experience and evidence of best practice and was endorsed by road safety experts as a model program.

Two years later a very different model from that which was originally proposed has emerged and, like many other jurisdictions, WA is likely to implement an interlock scheme that may not deliver optimum results. This paper provides an overview of the revised drink driving strategy that is to be implemented in WA and explores the systemic and structural impediments that contributed to the outcome. In doing so, it identifies issues that need to be considered from the outset and highlights approaches that may assist in the successful development and implementation of future interlock schemes.

What did we originally recommend?

The drink driving strategy that was proposed by the original working group in WA comprised a number of interrelated interventions aimed at all first time and repeat drink driving offenders with the aim of reducing the level of drink driving in the community.

The multi-faceted strategy included:

- An alcohol interlock scheme;
- A rehabilitation program, including assessment for all drink driving offenders and alcohol treatment for those with identified alcohol problems;
- Initiatives to limit unlicensed driving, including:
 - compulsory carriage of licence for all drivers and riders;
 - identification of licence condition on all driver's licences;
 - widespread random licence checks at the time of random breath tests (RBT) and during traffic policing;



- serious penalties for driving without a valid licence (DWVL) including roadside vehicle impoundment and vehicle confiscation for repeat offenders; and
- A mass media awareness and education campaign.

Within the integrated strategy, the interlock scheme was specifically designed to respond to the critical issues identified in the literature as limiting the success of interlock programs around the world: primarily that of low participation rates and the maintenance of outcomes over the longer term. The strategy in WA was also strongly focused on limiting unintended consequences, specifically those related to unlicensed driving. In response, the program was designed to:

- maximize participation by significantly reducing the period of hard suspension following a drink driving conviction where an offender agrees to only drive a vehicle fitted with an alcohol interlock;
- address participation barriers related to the cost of driving with an interlock;
- improve longer term outcomes by integrating interlocks with alcohol treatment; and
- limit unlicensed driving through a combination of compulsory carriage of licence for all drivers and riders, increased enforcement and instituting serious penalties.

The main components of the interlock scheme were as follows:

- An interlock licence would be available one month after a drink driving conviction;
- Drink driving fines would be deferred to offset the cost of interlock driving;
- All participants would be closely monitored utilizing interlock download data;
- The scheme would be performance based with a six month minimum interlock period and interlock removal would depend on the demonstration of safe driving;
- Early assessment would be available and those with identified alcohol problems would be referred to treatment ; and
- Vehicles sanctions (roadside vehicle impoundment for first time offenders and vehicle confiscation for repeat offenders) would be instituted for those detected driving outside their interlock licence conditions.

What processes did we undertake in the development of the drink driving strategy?

- An interagency working group was established to review the issue of drink driving in WA and recommend a strategy based on research evidence and best practice principles. The working group comprised representatives from key stakeholder agencies including senior personnel from police, justice, health, licensing, road safety and drug and alcohol research groups.
- Endorsement of the working group's report and all the recommendations was progressed through the independent Road Safety Council of Western Australia.
- A Discussion Paper, summarizing the proposed Strategy, was released to the broader community and submissions received.
- The funding requirements for all the agencies with responsibility for the various components of the Strategy were identified and endorsed by the working group.



- A detailed submission to Cabinet was collaboratively developed following extensive Ministerial and agency liaison.

What happened?

- A state election was called just as the submission was finalized to go to Cabinet and it was six months before it was put back on the agenda.
- During that time there were significant personnel changes within government and within the relevant government agencies.
- This resulted in the agencies (with new personnel) re-evaluating the Cabinet Submission and the original budget estimates. In doing so, a number of the agencies increased their budget bids significantly and indicated that they would not support the Submission unless the revised budget estimates were approved.
- A number of newly appointed senior government officials failed to champion the Submission when it eventually went to Cabinet, which resulted in some disunity amongst the stakeholders.
- This disunity was reflected in the media with print articles questioning the intent of Strategy, particularly the elements that recommended early interlocks and a reduction in licence disqualification periods. Essentially, the media pitch was that the new legislation would be allowing drink drivers back on the road presenting an unacceptable risk to the community. This perception was promoted strongly by talkback radio.
- As a result, the Government lost confidence in the proposal and sought amendments to the original submission that were more in line with perceived community opinion.
- A revised submission was requested at short notice; this was submitted and duly approved by Cabinet in November 2004.

What did we end up with?

The revised drink driving strategy for Western Australia that was approved by Cabinet at the end of 2004 contains a shift in policy direction from that proposed by the original working group. In the main, these changes in direction were influenced by senior government personnel who had not been part of the original group and by political pragmatism informed by perceived community opinion. It was extremely difficult for the research evidence to stand up to these challenges. Despite this, much of what was originally recommended has been maintained, however some important elements have been lost. The revised drink driving strategy now includes:

- An alcohol interlock scheme limited to repeat offenders and those with a first DUI (BAC \geq 0.15g/dl) conviction;
- Mandated interlocks as a condition of re-licence, with full disqualification periods to be served prior to an interlock licence being granted;
- Opportunities for an early interlock (one month after conviction) limited to those offenders that demonstrate a need to drive for work related reasons;
- Monitoring of interlock participant's driving through interlock download data;



- Performance-based participation in the interlock scheme with a minimum interlock condition of six months. Interlocks only to be removed following evidence of safe driving;
- Assessment and alcohol treatment limited to those that demonstrate non-compliance on the interlock scheme;
- All costs associated with interlock driving to be borne by participants;
- New legislation with provision for compulsory carriage of licence for all drivers and riders, identification of driving conditions on all drivers' licences and increased enforcement;
- New vehicle sanction legislation with provision to impound or confiscate the vehicles of those drivers that are detected driving without a valid licence;
- A three year independent evaluation of the drink driving strategy; and
- Parliamentary review of the new legislation at five years.

What did we lose through the process?

The revised drink driving strategy lost some important elements contained in the original proposal including:

- Early intervention for all first time drink driving offenders. By restricting eligibility for the interlock scheme to repeat and high BAC drink driving offenders the target group was considerably reduced, from a possible 16,000 to 5,500 per annum.
- The opportunity for drink driving fines to be deferred and used to offset the cost of interlock driving. The scheme will now operate on a user-pays basis and as a result a significant barrier to participation - that of cost - has been instated.
- The opportunity to reduce the licence disqualification period for all drink drivers who agree to only drive a vehicle fitted with an interlock. Interlocks will now have to be mandated as a condition of re-licence and full disqualification periods will have to be served before drivers are required to install an interlock. Early interlocks (after one month) are now limited to only those that can demonstrate a need to drive for work-related reasons.
- Assessment for all drink drivers immediately following a drink driving conviction and targeted alcohol treatment. Assessment for alcohol problems will now only be available to those engaged in the interlock scheme and where interlock download data indicates a breach of program conditions, thus limiting the number of people that may benefit from early assessment and treatment.

What did we gain through the process?

The negotiations that took place as part of the revised drink driving strategy allowed for more development time and delivered some additional provisions including:

- The allocation of generous developmental funding for the relevant agencies to undertake the necessary policy and program development related to the alcohol interlock scheme. In addition, in-principle support was provided from government for dedicated recurrent



funding for the relevant agencies. It is hoped this will facilitate a high standard of program operation being maintained into the future and good intra-agency collaboration.

- Funding for independent evaluation for a three year period after operation commences.
- A five year Parliamentary review of the new legislation.

What are the main risks contained in the revised strategy?

The process allowed for the possible risks related to the change in policy to be identified and to some degree minimized. The risks include the possibility that:

- Participation in the interlock scheme may be affected by increased barriers to entry related to cost and lengthy disqualification periods. During disqualification periods many offenders learn they can continue to drive with relative impunity and, once this learning is established, entry to the interlock scheme may appear onerous and unnecessary.
- Participants that engage in the interlock scheme may be the less severe drink drivers and/or those with ability to pay, and those that may benefit the most may fail to be engaged in the scheme.
- As a result of barriers to participation in the interlock scheme, unlicensed driving may increase especially amongst those that contribute to the majority of harm, such as multiple recidivists drink drivers, those that are alcohol dependent, unemployed, from lower socio-economic backgrounds and Indigenous people.
- Longer term outcomes may also be compromised due to assessment and alcohol treatment being limited to only those engaged in the interlock scheme. This may result in hard core offenders who fail to be engaged in the interlock scheme not having the opportunity to have their alcohol problems assessed and treated.

How do we intend to respond to these risks?

A three year independent evaluation will be conducted following proclamation of the new legislation. As part of the evaluation, comprehensive base-line data will be collected. The evaluation will include analysis of information related to all participants engaged in the interlock scheme as well as those drink driving offenders that are not engaged and therefore remain out of the system. In doing so, it is hoped the evaluation will identify any unintended consequences and highlight the associated cost to the community, particularly related to unlicensed driving. Along with the five year Parliamentary review of the legislation, this should enable any problems or issues to be identified and improvements recommended.

What did we learn from the process in Western Australia?

- Take time in the development phase and ensure that all recommendations are based on research evidence and best practice principles.
- Involve all stakeholders right from the start. Include those that have expertise and others that hold senior positions as decision makers in government (they are not necessarily the same people).



- Involve senior Ministerial advisors from the beginning and institute a process whereby political reality checks are fed into the process along the way.
- It is vital to widen the scope of enquiry to include potential unintended consequences and conduct careful risk analysis.
- Develop a communication strategy at the start and ensure that all stakeholders are continually briefed throughout the process.
- Have a number of contingency plans and fall back positions in relation to the model being proposed.
- Be very proactive when asked to compromise. Identify what is the most and least important elements of the model being proposed and offer what is least important when compromise is needed.
- Argue strongly for the key components of the model that should be retained and have clear research evidence to back up these assertions.

Summary

Western Australia undertook a careful and considered approach in developing a comprehensive strategy to counter drink driving that incorporated the latest research evidence and best practice principles that have been identified through considerable international experience. A model program was proposed based on a set of guiding principles that sought to maximize participation in the interlock scheme, address barriers related to cost, limit unintended consequences (such as unlicensed driving) and maintain outcomes for the longer term.

The main challenges lay in the translation of the recommended model into a “real world” program. The systemic and structural impediments that were encountered resulted in significant changes to the original policy direction and as a result the interlock scheme that is to be implemented in WA is unlikely to deliver optimum results as was originally hoped.

Nevertheless, many good elements of the proposed interlock scheme did weather the political and community scrutiny that was applied to the model during the implementation phase. In part, these elements survived because the research evidence was able to support their retention, validating the time taken to accumulate and document this material during the planning phase.

However, a number of important elements were lost despite solid research evidence to support their inclusion. They have been replaced with more “politically acceptable” alternatives and this may result in outcomes being compromised. Despite this, the work done in the initial planning stage allowed for some countermeasures to be put in place to better protect the integrity of the scheme and it is to be hoped that as a result some of the unintended consequences will be minimized.

The process in WA validates the need for careful planning in the early stages of developing an interlock scheme and supports the need to base all program elements on solid research evidence and best practice principles. Some of the impediments were unavoidable and could not be foreseen. However, the process would have benefited if the inevitable political reality checks had been introduced and appreciated earlier.

Most importantly, the people responsible for the initial planning were not the same people that made the final decisions, especially those that proved to be controversial such as immediate



interlocks, reduced disqualification periods and fines being deferred to offset interlock costs. Many of these decisions were made by politicians and senior bureaucrats who had not been part of the development phase and generally knew little about interlock schemes. It is therefore vital these decision makers are identified early in the process and actively involved in the planning and development of any interlock scheme.



i-KEY Drink Driving Prevention Systems

Thomas Von Gottberg

I-KEY

Hong Kong

Introduction

A drink driving survey conducted in Hong Kong in 2004 revealed that 90% of the population felt that drink driving was an extremely or very dangerous problem. Almost 40% of those surveyed acknowledged that they knew of friends/relatives having a drink driving experience; 26% acknowledged a personal drink driving experience; and 13% admitted to drink driving. Similar problems exist in North America with almost 40% of traffic fatalities being attributed to alcohol. Ignition interlocks are demonstrated to be a cost effective method of reducing drink driving recidivism and alcohol related crashes.

What is i-KEY?

The i-KEY is a breath alcohol testing device integrated into a car key to prevent impaired individuals from driving a vehicle. This product is unique because it requires no modification to the vehicle or special installation. In order to use the device, the driver must provide a breath sample by blowing into the key. If the breath alcohol concentration is below a preset limit, the key can be used to start the car. In the event that the breath alcohol concentration of the sample exceeds the preset limit, a short bar is released (dropping down parallel to the key) that blocks the key from fully entering the ignition slot where the key is inserted. As a consequence, the car cannot be started. The innovative design of this device continues to evolve and today the i-KEY is available, both with and without a key blade.

Why use i-KEY?

The i-KEY prevents drink driving. This enhances the driver's own safety; protects lives of citizens; reduces traffic accidents; and reduces social costs. Furthermore, it can ensure a safe drinking level at a low cost and high efficiency. There are no maintenance costs associated with the device and it is suitable to every vehicle. This device can be easily installed without causing damage to the vehicle or its performance. The i-KEY is also easy to carry with minimal risk of losing or forgetting it. This product can also effectively promote government policies against drinking and driving as well as enhance public awareness.

Who needs i-KEY?

Even though almost all drivers claim they will not engage in drink driving, many admit to not being able to accurately gauge their impairment level after drinking. Therefore common drivers of private cars, motor cycles, etc. are a logical end user for this product.

Moreover, since fleet owners must not allow their drivers to operate vehicles after consuming alcohol for reasons of legal liability, professional drivers constitute a second target group. Professional drivers of buses, taxis, goods vehicles, cargo trucks, etc. may also have use for the i-KEY.



Policy holders of motor insurance are a third potential target group as many insurance policies will not protect the driver in a drink driving accident.

The philosophy of i-KEY

The usefulness of the i-KEY is dependent on the willingness of drivers to take precautions to protect themselves. In this regard, the i-KEY is as useful as a seatbelt, windshield wipers or head lights when it is dark. It is assumed that bystanders or friends are not likely to deliver a breath sample to unlock the car key in case the driver has been drinking and fails to deliver the required breath sample.

The i-KEY is also intended to be an aid to mitigate the driver's fear for negative consequences after consume alcohol by allowing the driver to self test the alcohol concentration in his/her body and to act accordingly upon the result of the breath test.

The i-KEY can also reduce circumvention. Even though it is not yet a fool proof system the device will not accept a bogus air sample produced for example by a hair dryer or other means.

Conclusion

Efforts are ongoing to improve the technology and design of this product. The i-KEY device offers a practical and safe alternative to reducing drinking and driving and can also substantially reduce social and human costs. It is estimated that drink driving related accidents can be reduced by 75%-90%, reducing the number of working days that are lost and saving lives.



The Saab Alco Key

Anna Petre
Saab
Sweden

Introduction

Saab began in 1937 as Svenska Aeroplan Aktiebolaget. One of the first products they manufactured was airplanes. In 1947 Saab introduced its first automobile to the public, the 92 prototype, and by 1949 a production line had been implemented. Several decades later, Saab has grown into one of the world's leading high-technology companies. From the outset Saab has been concerned with safety. The Saab Real Life Safety Concept focuses on superior prevention and protection where it ultimately counts, that is, on the roads.

The Saab Real Life Safety Concept

The Saab Real Life Safety Concept is implemented through a cyclical process, fed by empirical data that is gathered from accident investigations and testing. Analyses are conducted to provide new data that can be incorporated into design guidelines. These guidelines are then implemented in prototypes by engineers and prototypes are thoroughly tested before production is begun. Once the finalized product is produced, accident data will be gathered again to improve the product so it ultimately becomes safer for the end user.

By applying this Real Life Safety Concept to problem areas, Saab was the first manufacturer to design the active head restraint (SAHR), the head thorax side airbag, the side curtain for frontal impacts and the advanced seatbelt reminder. As a result, a variety of Saab vehicles score very high ratings in both European and American consumer crash tests.

The Saab Alco Key

The Saab Alco Key is an innovative design that incorporates a breathalyzer into the ignition key. The alco key is unique because it is significantly smaller than traditional ignition interlock devices and does not require a complicated installation process. Moreover, the simplicity of this design makes it much more affordable than traditional devices. The device works when the driver blows a breath sample into a small mouthpiece at one end of the key. The breath sample enters a small internal tube that contains a semi-conductor. Once the sample has been analyzed, a red or a green light will be illuminated on the key to indicate the test results. If the green light is shown, the key will transmit an 'all clear' signal to the car's electronic control unit to allow the engine to be started. However, if the red light is shown the car will not start. To make the product adaptable to different jurisdictions, the software that instructs the engine immobilizer can be set according to the statutory limits of each jurisdiction. It is Saab's intention that the final product will incorporate the key and the testing device into a single, pocket-sized unit. The product is currently being tested in Sweden with the support of the Swedish National Road Administration.



The future

Saab is dedicated to continuing to make advances in vehicle safety and is devoting its resources to the production of safe products. The company is currently examining the potential to create a demand for safer products and identifying stakeholders with an interest in this area. Stakeholders, such as governments, authorities, transportation companies and driving schools all have a vested interest in safer products and there are a variety of different ways that this demand can be met. One example of such a demand is the interlock. The question of how this demand can be met becomes especially relevant in light of a safety feature like interlocks, since only a small proportion of the population drink and drive. Yet there is interest in this particular feature for public vehicles and private consumers.

Saab's approach is to design a product that is easy to use and that works efficiently. Unlocking the interlock before starting the car should not take longer than buckling up a seatbelt. The design should look attractive as well and fit with the design of the vehicle. With these principles in mind Saab designed the Alco Key Concept in August 2004.

Conclusion

Today there is a demand for interlocks. Public services, driving schools and private companies all show an interest in this safety product. There is a positive debate going on about interlocks and this might possibly create an interest in or demand for this product among private consumers. However, the quality and user friendliness of the interlocks on the Swedish market vary substantially, which could potentially jeopardize this product's market penetration.



Volvo Cars' Multilock Concept Vehicle

Henrik Forsgren
Volvo Car Corporation
Sweden

Introduction

Volvo is part of the Ford Motor Company and has been a wholly owned subsidiary since 1999. It is also part of the Premier Automotive Group, part of the Centre of Excellence for Telematics within the Premier Automotive Group, and part of the Centre of Excellence for Safety within Ford Motor Company.

Volvo has a long history of contributions to vehicle safety, beginning with their introduction of the safety cage in 1944, and followed by their three-point safety belt standard in 1959. Other contributions in the field of vehicle safety include the three-way catalytic converter with lambda sond in 1976; a side impact protection system in the 1990s, and a whiplash protection system in 1998. Most recently, Volvo has implemented rollover and compatibility systems in 2002 as well as the addition of a lamella bag in the recent C70 model.

Volvo's most recent contribution to vehicle safety is the Multilock concept vehicle which introduces improvements designed to address three priority areas in the field of traffic safety: sober driving, seat belt usage, and speed adaptation. International statistics demonstrate that a large proportion of fatalities and serious injuries are caused by drivers who are impaired by alcohol. The EU Commission reports that about 10,000 people die annually on European roads as a result of alcohol-related accidents. Moreover, serious personal injuries are most common among unbelted drivers and passengers. The multilock concept vehicle has incorporated safety improvements to address these problems.

This concept vehicle highlights three key features:

- ◆ an alcohol interlock combined with the driver's safety belt latch plate
- ◆ a belt interlock
- ◆ a speed limiter key

In order to start the vehicle, the driver must first provide a breath sample through a mouth piece that has been incorporated into the latchplate housing of the seatbelt lock. If the breath sample passes the breath test, the indicator on the latchplate will show green; if the breath sample fails it will show red. The pass or fail indicator is also repeated on the dashboard and confirms the driver's status. Once the driver is approved the safety belt must be latched in order to enable the engine to be started and this approval is also indicated on the dashboard.

As a final safety feature, a special key can also be ordered by the vehicle owner. This key can be preprogrammed with different settings, e.g., a maximum speed. A PC plus a special hardware application are used for programming the key, which can be done at any dealership.

This feature has applications for both private and commercial use. It can ensure that new or young drivers do not exceed a preset limit specified by their parents. International statistics indicate that young persons are typically over-represented in accidents, which can often result from high speeds combined with inexperience. Commercial fleet owners can also use this



feature to regulate drivers and ensure they adhere to speed limits, especially in urban areas where lower speeds are commonly mandated. Volvo is also exploring other applications for this feature including engine power, fuel economy, and logging of belt usage.

More work is required to refine this concept vehicle before it will be introduced but Volvo hopes this new vehicle will raise interest in traffic safety among key policy-makers as well as the general public. The real potential benefit from this concept lies in the transfer of these technologies to other Ford brands as well as other vehicle manufacturers.



Evaluation of Interlock Devices

Tom Bjerver

Swedish Abstaining Motorists Association

Sweden

Introduction

Ignition interlock devices, first developed in the 1970s, have been available commercially for more than two decades. In that time, the technology of these devices has advanced considerably and opportunities for circumvention have been substantially reduced. Moreover, the range of interlock devices has expanded and today there are a variety of devices available that are suitable for a diversity of uses.

The most popular use of these devices is to prevent convicted drunk driving offenders from driving while impaired. A growing use of these devices has also developed in the field of commercial transport. And more recently, private consumers have indicated a demand for these devices. In some jurisdictions parents are turning to this technology as a method of preventing teenage children from drinking when they are beginning to drive.

As a result, some interlock devices are more appropriate than others depending on the circumstances under which they will be used. Many of these devices have been independently evaluated in Sweden by the Swedish Abstaining Motorists Association.

Evaluation

A variety of interlock devices were considered as part of the evaluation including those used in offender programs, commercial programs and for personal use. Also some unique devices were included such as those for snowmobiles. Products included were manufactured by Alcohol Countermeasure Systems, Autosense International, Dräger, i-Key, Intoxalock, Lifesafer, Monitech, Saab, Sensolock, and Volvo as well as a variety of smaller manufacturers who make devices for commercial and personal use.

A broad range of factors were considered during the evaluation. The purpose of the interlock on a vehicle obviously has implications for the nature of the device. For example, the running retest may be necessary in offender programs while not applicable in commercial programs. Similarly, some devices have been programmed to permit an emergency override whereas others have not.

In general, devices relying on semi-conductor technology are not alcohol-specific and can result in false positive readings due to perfume or cigarette smoke. Moreover, these devices require frequent recalibration. Not surprisingly, few jurisdictions will permit the use of this technology in approved interlock devices, particularly with regard to offender programs. Most jurisdictions have turned to devices incorporating fuel cell technology which has successfully overcome both of the problems associated with the earlier technology.

Reliability of the devices is also a concern, particularly with offender-based programs. In these instances, it is critical that the device reliably measure the breath alcohol of the individual providing the breath sample and prevent these individuals from driving.



Calibration and service intervals also vary among devices. Calibration is critical to ensure the reliability of the BAC-reading is maintained for extended periods. Obviously, devices that require less frequent calibration are more convenient to use and place fewer demands on the user.

Features associated with the datalogger vary among devices. The primary purpose of the data recorder is to provide program monitors (judicial and administrative agencies) with a record of all uses of the device including any attempts to tamper with or circumvent its function. This may be a less important feature in commercial or personal use devices.

The quality of the hardware and the display varies across devices. Some devices are comprised of a single unit which can be problematic. For example, these devices are vulnerable to the loss of the sample head unit which can automatically lead to the loss of the data logs. Devices that physically separate the sample head from the data logger resolve this problem. The quality of the visual display is also critical as it can facilitate the use of the device and communicate clearly with the user.

Warm-up time is also an important component of these devices, particularly those that are used in colder regions such as Canada and Sweden. Often the device must be warmed up before it can function properly. Since longer warm-up times can be a nuisance and quick use is preferable, some manufacturers have added a remote warm-up feature that can virtually eliminate the waiting period before a breath sample can be delivered.

Anti-circumvention features also vary across devices. Some rely on running retests in which the driver must provide additional breath samples at specified intervals once the vehicle has been started. This ensures that the driver is not drinking while driving. Other devices may rely on certain blowing techniques such as the hum-tone or suck-and-blow. Many devices have incorporated a variety of techniques to reduce opportunities for circumvention.

Conclusions

Today interlocks are very sophisticated devices that have incorporated a number of features that make them attractive in certain settings. Many manufacturers produce a variety of products specific to certain situations and technological advances are currently focused on easier installation and use as well as driver identification.



Decision criteria for predicting which interlock drivers warrant continuing control

Paul R. Marques, Ph.D, Robert B. Voas, Ph.D. and collaborators
Pacific Institute for Research and Evaluation
Calverton, MD USA

We can all imagine a future in which the public will come to demand comprehensive solutions to roadway alcohol related death tolls, finding annual rates well over 38% to be no longer acceptable. When such a future arrives it will likely include some form of in-vehicle alcohol monitoring as an essential part. It may be that Sweden will point the way since they have been safety leaders for many years and are currently planning on a 2012 national requirement to equip all new vehicles with interlocks. Whether or not all vehicles someday have some type of ignition interlock, we expect that at least the vehicles of known alcohol offenders will be equipped to detect, lock-out or instantly report violations.

By the time that future unfolds we will ideally have developed more dependably effective treatment interventions that are properly funded, then responsibly monitored and implemented. We will also have settled upon objective means of documenting which of the potentially reformed drinking drivers have lowered their public risk adequately to warrant full restoration of driving privileges. This paper describes some methods by which we may distinguish people who continue to drink in a problematic way from those who have really reduced public risk exposure.

We know that the interlock brings both DWI control and prediction. Those who resist the control and continue to drink can become known to us by examining the log of breath tests. We have demonstrated now in 3 different jurisdictions: Alberta, Quebec, and Texas, that the pattern of elevated interlock breath tests is predictive of future drinking and driving. We have shown that the rate of elevated breath tests overall and a pattern of morning elevated breath tests are both predictive of heavy drinking and a high likelihood of future impaired driving. A continuing weak point in this equation is the inability to specifically link the breath test record to any one individual since friends or family members can also drive the interlock car. We can suspect with high likelihood that stored breath tests in the car belong to our target offender, but we cannot know that without doubt. An objective supplement to exclusive reliance on breath test data from the car is body specimen data from the blood, hair, or urine of the individual. In this case there is no doubting the origin of the sample. The alcohol biomarkers contained in these specimens are often direct metabolites of alcohol that derive from minor metabolic pathways. Traces of these markers can persist for many days, unlike markers from the majority path of alcohol metabolism (e.g., via alcohol dehydrogenase) that degrades ethanol within several hours.

Currently the drawbacks to more widespread use of these biomarker sources are: the inertia of tradition, their cost, and the high state of flux with new markers being discovered each year. All of these barriers and issues will resolve over a short time. Automation and volume will reduce cost and eventually the best markers will be revealed through research. The recent growth of drug testing drivers (for which there is no breath alternative) will lower the threshold to working with body fluid specimens. We know that many police officers are ready and willing to collect specimens.

In this paper, we review the evidence from multiple sources that document the importance of detecting high risk drivers while they are still captives in interlock programs. The opportunity presented by interlock restricted driving should not be squandered since the interlock brings



multiple opportunities to evaluate each user due to required periodic (e.g., monthly or bimonthly) visits to check equipment. At some or all of these visits, blood, hair and/or urine sampling would afford an opportunity to sort out drivers into high, medium and low risk pools.

In a research program funded by the US National Institute of Alcohol Abuse and Alcoholism, we have now collected blood, hair and are beginning to collect urine samples from cooperating interlock offenders in Alberta Canada. Those agreeing to participate in the research are paid to complete assessment instruments (Timeline Followback, Computerized Diagnostic Interview Schedule, Drinker's Inventory of Consequences, AUDIT) in addition to allowing us to collect biosamples. Our preliminary evaluation of ten biomarkers (3 from hair, 2 from whole blood, 5 from serum) has now shown that of all the markers, phosphatidyl ethanol (PEth) in whole blood is most strongly correlated with all the other markers, most strongly associated with self-report levels of drinking in the past thirty days, and importantly, most strongly correlated with the rate of blowing elevated BAC tests on the interlock device over a period of many months. Some of the markers under study are routinely measured in clinical chemistry laboratories and these include gamma glutamyl transferase (GGT), aspartate aminotransferase (AST), alanine aminotransferase (ALT), mean red cell volume (MCV). For these measures, the local laboratory Dynacare Kasper is making the measurements. Some of these show good relationships to self report, driver performance and BAC test data. The newer markers are more interesting in general, however.

From 57 drivers providing samples to date, Pearson correlations of .53 and .54 respectively were found for the relationship between the count of all BAC tests $>.04\%$ and the rate of all elevated BAC tests relative to all tests taken. Still somewhat hampered by small numbers, nonetheless another excellent marker is the amount of fatty acid ethyl esters (FAEE) in hair samples. The alcohol markers in hair persist for many months since once incorporated from hair follicles into the growing hair shaft, the FAEE remains and undergoes no metabolism. Hair markers can reflect many months of prior alcohol consumption. Drugs have been detected in hair for many years, but work by Fritz Pragst at Humboldt Univ. in Berlin, Germany has made it possible to detect alcohol metabolic products in hair as well. The collaborators in this research beside Pragst are shown below:

- Phosphatidyl Ethanol in whole blood
 - Drs. Christer Alling, Steina Aradottir, Dept. Medical Neurochemistry, Lund Univ. Lund Sweden
- Fatty Acid Ethyl Esters in hair
 - Drs. Fritz Pragst, Volker Auwaerter, Inst. Legal Medicine, Humboldt Univ. Berlin Germany
- Ethyl Glucuronide in hair
 - Dr. Michel Yegles, National Lab. Health, Univ. Luxembourg, Luxembourg
- Ethyl Glucuronide in urine and European Coordination
 - Dr. Frieder Wurst, Psychiatric Univ. Hospital, Basel Switzerland
- Percent Carbohydrate Deficient Transferrin in serum
 - Dr. Martin Javors, Univ Texas San Antonio
 - Texas, USA
- Sialic Acid Index of Apolipoprotein J
 - Dr. Raj Lakshman, George Washington Univ and VA Hospital
 - Washington DC USA



The results of this study will continue to unfold for the next three years at which time we expect to have a comprehensive profile of the relationship between driver behavioral markers of impairment (alcohol interlock tests) and biological markers of impairment (biomarker tests). At this stage the self-report measures are concordant with the blood and interlock measures but in the real world where there may be consequences for reporting continuing drinking when the court has required that people not drink, the value of self-report measures can be expected to be quite a lot lower.

The next challenge will be to suggest a routine set of profiling tasks and encourage the courts or program administrators to use them for relicensing decisions.



Primary and secondary prevention of drink-driving by the use of interlock device and program: Swedish experiences

Bo Bjerre
Traffic Medicine Advisory Board
Swedish Road Administration
Borlänge, Sweden

To prevent drinking and driving, interlock (or alcohol-interlock) devices and programs were introduced in Sweden in 1999. Two types of prevention programs were begun. A primary prevention strategy was initiated to prevent alcohol impaired driving by individuals not pre-selected for having prior DWI offences. This approach was first applied as a pilot project in three commercial transport companies (buses, trucks, taxis). Also a secondary prevention trial was begun as a voluntary 2-year program for DWI offenders involving strict medical requirements, including counseling and regular checkups by a medical doctor. The program did not require a prior period of hard suspension and focused on changing alcohol use habits.

Interlocks in commercial vehicles have been well accepted by professional drivers, their employers, and their passengers, and the number of vehicles with interlocks as a primary prevention measure is rapidly growing in Sweden. Three of 1000 starts in the primary prevention program were blocked by the interlock after measuring a BAC higher than the legal limit and lock point of .02% (20 mg/dl).

Only 11% of eligible DWI offenders took part in the voluntary, secondary prevention program. Of these, 60% had diagnoses of alcohol dependence or abuse. During the program, alcohol consumption generally decreased significantly as measured through five biological alcohol markers, and the rate of DWI recidivism fell sharply from a yearly rate of approximately 5% to almost zero. These effects on DWI recidivism are paralleled by reduced rates of police-reported traffic accidents involving injuries and hospital admissions due to road accidents. Successful completion of the program appears to have lasting effects (even 2.5 years later) in terms of far lower rates of DWI recidivism and maybe also lower crash rates. On the other hand those being dismissed from the program appear to rapidly return to previous behaviour.

Hard suspension seems almost to have an adverse effect on DWI recidivism, but crashes resulting in injuries may be reduced during revocation.



Motivating DWI Offenders To Install Interlocks, What Works?

Richard Roth¹, Paul Marques², and Robert Voas²

¹ **Impact DWI, Santa Fe, NM**

² **Pacific Institute for Research & Evaluation, Calverton, MD**

New Mexico is located in the southwestern region of the United States. It has a population of 1.9 million and 1.3 million licensed drivers. Approximately 20% of the licensed drivers have been arrested at least once for DWI in the last 21 years. Annually, 20,000 individuals are arrested for DWI and 12,500 are convicted. In the last two years, over 6,000 have installed ignition interlocks.

Interlock laws and programs can reduce DWI arrests, but this only happens when they result in interlocks being installed. Laws and programs themselves will not reduce recidivism, however, installed interlocks can and do.

There are multiple features of laws and programs that result in interlocks actually being installed. These features vary along a 'motivation' continuum and range from incentives to mandates -- or from carrots to sticks.

Examples of gradual incentives or carrots include: 1) reducing the length of the license revocation period (e.g., from 2 years to 1 year if the offender installs an interlock in the second year); 2) requiring a period of driving with an interlock before one is eligible for an unrestricted license; 3) legal and immediate driving of an interlocked vehicle following a DWI arrest -- this is the carrot that currently exists in New Mexico.

Moving further along the motivation continuum there are judicial mandates or 'sticks'. Mandates may include: 1) an ignition interlock period as an optional sentence for multiple offenders; 2) interlocks as an optional sentence for high BAC offenders; 3) a mandatory sentence for some offenders; and finally, 4) a mandatory sentence for all convicted offenders. But even mandatory sentences do not result in certainty that an interlock will be ordered or installed, as there is often room for broad interpretation of laws and programs. One way to avoid these loopholes is to require house arrest as an alternative for those who claim that they are not driving. Other alternatives include the loss of the vehicle by immobilization, impoundment or forfeiture. And still, these mandates would not address those drivers who are arrested but not convicted.

In NM, and elsewhere, most of the DWI laws have targeted multiple offenders with little effect on the number of first offenders, the largest group. An analysis of DWI arrests and convictions in New Mexico revealed that most of the individuals arrested are 1st offenders.

Laws that would use interlocks to reduce the recidivism of offenders after their 2nd offense would only impact a small fraction of convicted offenders. Moreover, because of the plea bargaining process, many 2nd and 3rd convictions are pled down to 1st convictions and therefore even though they have been convicted more than once, they would not be subject to the legal sanctions for 2nd and 3rd offenders.

There is evidence that all DWI laws, at least in NM, have targeted multiple offenders to the exclusion of first offenders. Between 1990 and 2000, the recidivism rate for multiple offenders has decreased much more than that of first offenders. NM laws have had the largest effect on the smallest group of offenders. They have had much less of an effect on the recidivism of 1st offenders, who are more than half of those arrested each year.



As stated previously, in New Mexico the interlock laws have spanned the motivation continuum ranging from incentives to mandates. In 1999, Roth drafted and lobbied for a law to mandate interlocks for all convicted offenders. Unfortunately, the legislature reduced this law to an optional judicial sentence for second and third offenders. Under this law fewer than 150 interlocks were installed per year for 3 ½ years. In 2002, a mandatory judicial sanction was passed but it did not apply to all offenders. Loopholes included: 1) omitting first offenders with low BAC's; 2) omitting those who pled down to a first offense; 3) omitting those who successfully pled "no vehicle" or "not driving"; and, 4) no service of warrants on those who failed to comply with the sanction. Moreover, many judges were reluctant to mandate interlocks for offenders who were revoked and could not drive legally. As part of the legislation, an indigent fund was implemented and supported by a surcharge on the non-indigent interlocked offenders.

In 2003, to correct some of the loopholes, Roth drafted the "Ignition Interlock License Act", which the legislature subsequently passed. This act created a complete alternative to hard revocation -- immediately after an arrest and license revocation, a revoked offender is eligible for an interlock license that allows legal driving in an insured, interlocked vehicle.

These new laws had a positive effect on the installation of interlocks. Under the optional mandate for 2nd and 3rd offenders, only 500 interlocks were installed in 3.5 years, a rate of 137 per year. When the mandatory law for high BAC and subsequent offenders became law on January 1, 2003 the rate jumped to 1000 per year. When the Ignition Interlock License Act went into effect in June 2003, the installation rate jumped again to about 3000 per year. The Interlock License Act both overcame the reluctance of judges to mandate interlocks for those who could not drive legally and gave the incentive of legal driving to offenders who were revoked but not mandated to install an interlock.

Since the Ignition Interlock License Act became Law in 2003, over 5,500 licenses have been granted by MVD and the rate in 2005 is over 3,000 per year. Thus there are 3,000 revoked DWI offenders who are able to drive legally in interlocked vehicles when sober.

This year NM passed a law mandating interlocks for all convicted DWI's: 1 year for first conviction, 2 years for second, 3 years for 3rd and lifetime with 5 year review for 4th offenders. This law also closed the loopholes of "not driving" or "no vehicle" by mandating an Ignition Interlock License rather than mandating "an interlock in all vehicles driven by the offender." Roth estimates that the new law will increase the rate of interlock installations to 7,000 per year.

There is certainly a long way to go to reach the goal of interlocks in the vehicles of all of the 12,500 convicted offenders each year. And if we believe that all arrested DWI offenders should be interlocked, then the goal is even higher.

If you believe that interlocks are the most effective, cost-effective, and fair sanction for DWI offenders then it is clear that there is much of room for improvement, even in New Mexico which has more interlocks per capita than any other state. Laws alone do not get interlocks installed. Interlock installations per conviction vary widely across the state. The state average is 12% and only 7 of the 33 counties in the state are above the state average. In Santa Fe County, 45% offenders convicted in 2004 installed interlocks before July 1, 2005. And the three judges in Santa Fe Magistrate court managed to get 66% of the 701 persons they convicted in 2004 to install interlocks. The Santa Fe Magistrate Court Judges simply mandated interlocks for all convicted offenders with house arrest at offender expense as the only alternative. Unfortunately these same judges usually mandated interlocks for only 90 days, the maximum jail term for first



offenders. They did not realize that the law said “1 year”, not “up to 1 year” and that the probation period is not limited to the maximum jail term.

Some reasons that some incentives and mandates do not result in interlocks being installed include the following:

- ◆ Even a minimum period of revocation teaches offenders that they can get by with driving without a license and doing so is much cheaper and less bother than installing an interlock.
- ◆ Judges rarely use costly optional judicial mandates.
- ◆ Any judicial mandate is bound to have loopholes that offenders exploit.
- ◆ 25% to 40% of offenders are not convicted and avoid interlocks entirely.

In summary, the goals of an ideal ignition interlock program would be to get interlocks into the vehicles of all DWI offenders as soon as possible after arrest, and to keep them installed until the offender has completed one continuous year of alcohol-free driving. The components of such a program would include:

1. Immobilization or interlock between DWI arrest and adjudication;
2. An interlock license as an alternative to hard license revocation;
3. Mandatory interlocks for at least one year for all convicted DWI offenders with vehicle immobilization as the only alternative;
4. Compliance based removal, i.e. no recorded BAC > .04 by any driver of the interlocked vehicle for a year; and
5. An indigent fund with objective standards.

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Mandating Interlocks for Fully Suspended Offenders: The New Mexico Experience

Richard Roth¹, Robert Voas², and Paul Marques²

¹ Impact DWI, Santa Fe, NM

² Pacific Institute for Research & Evaluation, Calverton, MD

Background

There is substantial evidence that interlock devices, which require the driver to take a breath test to start the car, are effective in reducing the recidivism of drivers convicted of driving while impaired (DWI) by 35 to 75% while installed on the vehicle (DeYoung et al., 2005; Coben & Larkin, 1999; Voas et al., 1999). A recent meta-analysis by Willis, Lybrand, and Bellamy (2004) found that, while installed, the interlock reduced the relative risk of DWI recidivism to .36. A major limitation in their effectiveness, however, has been the reticence of judges to impose interlocks and the resistance of offenders to install these devices due to cost and conflict in laws. Generally, only 10 to 20% of offenders eligible for interlock programs install such devices (Voas et al., 2002).

A significant impediment for interlock programs in many states has been the conflict between the laws requiring a minimum “hard” (no driving) suspension period and the laws allowing for issuance of a limited license to operate an interlock-equipped vehicle. Because up to 75% of suspended offenders drive illicitly to some extent during their suspensions (Ross & Gonzales, 1988; McCartt et al., 2002), there is justification for requiring an interlock on the vehicle of a fully suspended offender. However, many judges refuse to do so arguing that it sends the wrong message to offenders (i.e., the court expects them to drive illicitly).

Objective

This paper considers the efficacy of interlocks in a context in which the court interlock order conflicted with the state license suspension laws. From July 1, 1999, to January 1, 2003, New Mexico had a law making ignition interlocks an optional judicial sanction for second and third DWI offenders, while a second New Mexico law required a 1-year hard suspension for second DWI offenders. A judicial requirement to install an interlock did not affect the suspension status of the offender. Consequently, 95% of the subjects in this study were suspended when they installed interlocks. This study was an attempt to determine whether interlocks are effective under such circumstances.

Methods

In New Mexico, interlock service providers are required to forward records of all installations and removals to the state Traffic Safety Bureau. We selected offenders from these who installed interlocks from July 1, 1999, to December 31, 2002, and matched them with DWI arrest and conviction records in the New Mexico Motor Vehicle Division DWI Citation Tracking System (CTS). The CTS, a statewide offender tracking system, contains the records of every driver arrested for a DWI offense in New Mexico. Our objective was to determine the recidivism rate of those who installed interlocks compared to similar offenders who did not install units during three periods: (1) while the interlock was on the car, (2) following removal of the interlock, and (3) over a 4-year interval that combined periods 1 and 2. The experimental group included 437



multiple offenders who installed interlocks for an average of 322 days during the 3-year period following their conviction. The comparison group was a stratified random sample (N = 12,554) of the 20,949 subsequent offenders who were convicted during the same period. Survival graphs and Cox proportional hazard regression analyses were used to compare the interlock and noninterlock groups during installation, after installation, and for the entire period up to December 2004.

Results

Only 11 (2.5%) of the interlocked offenders were rearrested for DWI while interlocks were installed, whereas 1,017 (8.1%) of the comparison group were rearrested during an equivalent 322-day period. Results confirm a reduction in recidivism of 65% during installation. After removal, there was an additional small but not statistically significant ($p = .4$) 9% reduction in recidivism relative to the comparison group in a 3-year follow-up period. Following all offenders for a total of 4 years, including the during-installation and after-removal periods, the reduction in recidivism rate was 22%, indicating that the difference in recidivism achieved during installation is maintained but not significantly increased thereafter.

Conclusions

Our 22% reduction in recidivism over a 4-year period is about the same as that of a similar study by DeYoung (2002) in California who reported an 18% reduction in recidivism. It also is interesting to note that the relative risk of .35 while the interlock was on the vehicle in the current study is almost identical to the .36 reported by Willis, Lybrand, and Bellamy (2004) in their meta-analysis of interlock studies. This suggests that although a conflict between suspension requirements and interlock installation may substantially limit the use of such devices, those offenders who are forced to install the units by the court experience similar reductions in recidivism to offenders who voluntarily install the devices when their use results in the issuance of a limited driving permit allowing offenders to drive the interlock car legally.

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References

- Coben, J. H., & Larkin, G. L. (1999). Effectiveness of ignition interlock devices in reducing drunk driving recidivism. *American Journal of Preventive Medicine*, 16(1S), 81–87.
- DeYoung, D. J. (2002). An evaluation of the implementation of ignition interlock in California. *Journal of Safety Research*, 33(4), 473–482.
- DeYoung, D. J., Tashima, H. N., & Maston, S. V. (2005). An evaluation of the effectiveness of ignition interlock in California. In P. R. Marques (Ed.), *Alcohol Ignition Interlock Devices—Volume II: Research, Policy, and Program Status 2005* (pp. 42–52). Oosterhout, The Netherlands: International Council on Alcohol, Drugs and Traffic Safety.
- McCartt, A. T., Geary, L. L., & Nissen, W. J. (2002, September 2002). Observational study of the extent of driving while suspended for alcohol-impaired driving (DOT HS 809 491).



Washington, DC: U.S. Department of Transportation, National Highway Safety Administration.

Ross, H., & Gonzales, P. (1988). The effect of license revocation on drunk-driving offenders. *Accident Analysis and Prevention*, 20(5), 379–391.

Voas, R. B., Blackman, K. O., Tippetts, A. S., & Marques, P. R. (2002). Evaluation of a program to motivate impaired driving offenders to install ignition interlocks. *Accident Analysis and Prevention*, 34(4), 449–455.

Voas, R. B., Marques, P. R., Tippetts, A. S., & Beirness, D. J. (1999). The Alberta Interlock Program: The evaluation of a province-wide program on DUI recidivism. *Addiction*, 94(12), 1849–1859.

Willis, C., Lybrand, S., & Bellamy, N. (2005). Alcohol ignition interlock programmes for reducing drink driving recidivism. *Cochran Database of Systematic Reviews*(4), CD004168.



Ignition Interlocks as Alternatives to Hard Revocation for DWI Offenders

Richard Roth,² Robert Voas,¹ and Paul Marques¹

¹ Pacific Institute for Research & Evaluation, Calverton, MD

² Impact DWI, Santa Fe, NM

Introduction

New Mexico's Ignition Interlock License Act (IILA) provides a complete alternative to the hard license revocation for drunk drivers. Any suspended offender who installs an ignition interlock can get a limited license to drive an interlock-equipped vehicle for the remainder of the suspension period at anytime. "Voluntary" interlock programs that offer suspended offenders the option of installing an interlock in order to drive legally are in place in a number of states; however, most are limited to certain levels of offenders (generally second or multiple offenders) and for specific periods. For example, California, which imposes a 2-year suspension on second driving-while-impaired (DWI) offenders, allows the individual to request a limited interlock license in the second year of the 2-year suspension. The New Mexico IILA is unique among such programs because it allows offenders to install an interlock in lieu of being fully suspended. Consequently, the individual does not have to serve a "hard" suspension period before they become eligible for an interlock program. Moreover, any offender who is currently serving a long-term multiyear suspension can apply for a limited license to operate with an interlock.

This policy of allowing offenders to install interlocks in lieu of hard suspension has been found to be effective in reducing recidivism by up to 90% (Voas et al, 1999, Willis, Lybrand & Bellemy, 2005). However, offenders' responses to this opportunity have been limited. Generally, less than 10 to 20% of the eligible offenders elect to install interlocks. In the California program mentioned above, for example, DeYoung (2002) reported that, in 2001-2002 when 20,000 second offenders were estimated to be eligible to install an interlock in order to drive legally for the last year of their 2-year suspension, only about 50 a month were doing so. Voas et al. (2002) have reported similar low-response rates to the opportunity to obtain the driving privilege by installing an interlock.

When the New Mexico IILA law went into effect on June 1, 2003, the rate of interlock installations increased sharply, from 1,000 (8%) per year to 3,300 (26%) per year, but whether this law, which greatly widens the opportunity to take advantage of the interlock, will substantially increase the number of offenders installing the device remains to be determined. A second issue is whether inviting long-term suspended offenders to reinstate their licenses by installing interlocks will show the same recidivism reductions that have been experienced by offenders who take advantage of the traditional programs, which are limited to specific short periods following conviction. This study considers that issue.

Methods

The IILA provided a legal driving option to those who were revoked for DWI but not judicially mandated to install an interlock. So the increase from 8 to 26% included installations by revoked offenders who were not judicially mandated to install an interlock. To study the effect of the IILA on installations by DWI offenders not mandated by the courts to install the units, we examined



the DWI re-arrest rate of interlock offenders with a 10-year license revocation who had installed interlocks between 2003 and 2005. Before June 2005, New Mexico revoked the license of anyone convicted of DWI three or more times (within a 10-year period) for 10 years from the date of the last conviction. We identified 15,571 persons in this group who were eligible for an interlock license, and 1,300 of them had actually installed interlocks. To ensure that the interlock group was made up of offenders who voluntarily installed interlocks, we included only those revoked drivers who had not been convicted within 90 days before installation. Installations within 90 days after a conviction were considered mandatory and were excluded from this study.

The interlock group was compared to the 14,271 persons who had a 10-year revocation but did not install an interlock. The interlock group had more average convictions and more refusals to submit a breath test, but they had fewer high BACs. They had about the same average age and the same distribution of gender.

Before the end of the study, 354 persons in the interlock group had their interlocks removed. This made it possible to break down the recidivism rates for the 1,300 interlock users into three periods: (1) the period during which the interlock is installed, (2) the period between the removal of the interlock and the end of the study period, and (3) the total period from initial installation to the end of the study period in June 2005, which combines the first two periods. Recidivism rates for each of those three periods were contrasted with the recidivism rate of the control group during the year following their third conviction.

Results

Table 1, Provides the annualized recidivism rates for two groups of third offenders suspended for 10 years. While the interlock was in place, the interlock group experienced a 4.4% recidivism rate, which is much lower than the 12.5% rate experienced by the nonusers. The difference in the rates is 8.01%, and the 95% confidence interval for that difference ranges is from 6.83% to 9.25%, which is highly significant ($p < 0.001$).

Table 1: Annualized Recidivism Rates for the Interlock and Comparison Groups

| | Control Group | Interlock Group |
|--|---|-------------------------------------|
| Subsequent Recidivism | 12.5% per year After 3 rd conviction in 10 yr | 4.4% per year After Installation |
| Recidivism While Interlocked | | 3.3% per year |
| Recidivism After Interlock Was Removed (N=354) | | 9.5% per year |

The per year recidivism rates during installation and after removal are shown in Table 1. While interlocks were installed, the per-year recidivism rate was 3.3%. Compared to the 12.5% subsequent recidivism of the control group, the rate difference was 9.2% and the ratio of rates was 0.27. The average time after removal was 282 days and 26 persons were rearrested in that period. So the per year recidivism after removal was 9.5% $[(26/354) * 365/282]$. This 9.5% rate is 3% lower than the comparison group's, but it is not statistically significant.

Discussion

This study demonstrates that offenders with lengthy suspensions who voluntarily install interlocks exhibit recidivism levels while the devices are installed that are about one-quarter of those exhibited by similar offenders who do not apply for an interlock. This is consistent with



previous interlock studies that have dealt with judicially mandated interlock programs. An important element of this study was the significant overall reduction in recidivism of 8.1% both during the exposure time on the interlock and during the period following its removal. This demonstrates that, although it no longer produces a statistically significant reduction in recidivism after the device is removed, its impact is preserved over an extended period. Overall, therefore, interlock users will have better records than nonusers. Thus, the policy of making the interlock available to all DWI offenders appears to be valid.

A limitation of this research, which is similar to other interlock studies, is that since the participants were not randomly assigned to the interlock and comparison group, the users may be a select group of offenders who would in any case be likely to have lower recidivism levels than nonusers. Finally, even if those who voluntarily install interlocks are less likely to drive after drinking even before installing interlocks, there is a societal benefit of allowing them to drive when sober. They may resume doing those things for which a vehicle is required in our society while not posing a threat to other drivers, passengers, and themselves. They may drive to work and thus earn money, support their families, and pay taxes.

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References

- Voas, R. B., Marques, P. R., Tippetts, A. S., & Beirness, D. J. (1999). The Alberta Interlock Program: The evaluation of a province-wide program on DUI recidivism. *Addiction, 94*(12), 1849–1859.
- Willis, C., Lybrand, S., & Bellamy, N. (2005). Alcohol ignition interlock programmes for reducing drink driving recidivism. *Cochran Database of Systematic Reviews*(4), CD004168.
- DeYoung, D. J. (2002). An evaluation of the implementation of ignition interlock in California. *Journal of Safety Research, 33*(4), 473–482.
- Voas, R. B., Blackman, K. O., Tippetts, A. S., & Marques, P. R. (2002). Evaluation of a program to motivate impaired driving offenders to install ignition interlocks. *Accident Analysis and Prevention, 34*(4), 449–455.



Hospital care and sick leave related to DWI offences. A comparison between licence revocation and an alcohol ignition interlock programme

Bo Bjerre
Swedish Road Administration
Borlänge
Ulf Thorsson
Statistics Sweden
Stockholm

Background

Most drink-drivers have serious alcohol problems. In serious drink-driving (BAC>0.1%) in Sweden, the licence is revoked for at least 12 months, resulting in social complications and extra expense. Alternatively, offenders can participate voluntarily in an ignition interlock programme with regular medical checks.

Purpose

The interlock programme aims to alter participants' alcohol habits. To evaluate the programme's rehabilitation effects, hospital care and sick leave register data have been studied and compared with control groups with revoked licences.

Results

In the five years preceding the DWI, all drink-drivers studied recorded significantly more healthcare consumption and sick leave than a comparable, age-standardised Swedish average. Of the participants in the programme, 59% were diagnosed as alcohol dependent/abusers at trial start. During the programme, the number of annual care days (any medical diagnosis) in hospital fell significantly ($p<0.01$) and the proportion of care days under alcohol-related diagnoses halved. Sick leave however rose significantly ($p<0.001$), maximising during the short "administrative" period before interlock installation. For the control group with revoked licences, there was a significant increase in healthcare consumption irrespective of diagnosis ($p<0.001$), alongside an increased proportion of care under alcohol-related diagnoses. Sick leave also increased dramatically.

Conclusions

Voluntary participation in an interlock programme, unlike licence revocation, has favourable effects with far less need for hospital care and lower sick leave. This is probably linked to reduced alcohol consumption during the programme and the ability to continue driving. After the programme, sick leave remains unchanged while healthcare consumption increases, mirroring that of control groups.

Note: Symposium papers from William J. Rauch will be added shortly.

