Impaired Driving Enforcement Programs

Evaluating Their Effect on Alcohol-Related Casualty Collisions in Saskatchewan

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Traffic Safety Program Evaluation
SGI Auto Fund
1. Background

2. The Programs – EOD and RID

3. Analysis
   • Study objectives and data
   • Methodology and challenges

4. Results
   • Policy implications
   • Considerations for future evaluation
Drinking and Driving in Saskatchewan

- Alcohol impairment has consistently been one of the top contributing factors in serious collisions in Saskatchewan.
- Since the early 90’s, Saskatchewan has led the nation in per-capita alcohol-related (AR) traffic casualties.
- On average, 59 people are killed and more than 700 injured in AR collisions every year in the province.
- Research has shown that perceived risk of apprehension is more important than severity of punishment as a deterrent factor.
- Therefore, in addition to strong sanctions, sustained and highly visible enforcement is necessary to reduce impaired driving behaviour.
Consequences

- New drivers are subject to zero BAC tolerance.
- For experienced drivers, administrative sanctions at 0.04 BAC, Criminal Code charges at 0.08 BAC.
- Sanctions escalate upon subsequent offences.
- Immediate roadside licence suspension, vehicle impoundment, financial penalties, alcohol and drug education programs, ignition interlock...
- With changes to traffic safety legislation in 2014, drug-impaired drivers now face the same consequences as alcohol-impaired drivers.
ENFORCEMENT

If you drink and drive, you will get caught.

- Implemented in Regina in late 2000, expanded to other communities over the next ten years.
- Operation of stationary checkstops with the primary goal of detecting and apprehending impaired drivers.
- Focus was broadened in 2011 to include both targeted mobile patrols and stationary checkstops.
• Piloted in Saskatoon in 2010, expanded to other communities over the next few years.

• Citizens are encouraged to call 911 and report drivers they suspect are impaired.

• Police attempt to locate the vehicle, a warning letter is sent if it isn’t intercepted.
Impaired Driving Enforcement in Saskatchewan

- EOD - Regina (Dec’00)
- EOD - Saskatoon (Jun’02)
- EOD - Moose Jaw (Mar’06)
- EOD - Reg IP (Jan’10)
- RID - Regina (Sep’10)
- RID - Prince Albert (Mar’11)
- RID - Weyburn (Sep’11)
- RID Goes Province-Wide (Nov’11)
- EOD - Estevan (Aug’09)
- RID - Estevan (Sep’11)
- EOD - File Hills (May’10)
- EOD - Moose Jaw (Mar’11)
- Legislative Changes (Nov’01)
Objective

Evaluate the long-term impact of Enforcement Overdrive and Report Impaired Drivers on AR casualty collisions in Saskatchewan communities.

Specifically:

- Determine the number of collisions prevented; and,
- Estimate the return on investment for funding these programs.
Study Data

- AR casualty collision data from 1997 to 2012
- Licensed driver counts
- Population, unemployment rate
- Data was grouped on a monthly basis for six main communities (Regina, Saskatoon, Prince Albert, Moose Jaw, Estevan, Weyburn)
- Indicators for months with an extra Saturday and presence of each enforcement program
Methodology

Intervention Analysis:

- Negative binomial regression with GEE
- Examine the effects of multiple interventions with different implementation dates in separate cities

Cost-Benefit Analysis:

- Modified cash flow method
- Collision reduction estimated using NB model
## Intervention Analysis

<table>
<thead>
<tr>
<th>Factor</th>
<th>Levels</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>City</td>
<td>1 – Regina* 4 – Moose Jaw</td>
<td>Location</td>
</tr>
<tr>
<td></td>
<td>2 – Saskatoon 5 – Estevan</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 – Prince Albert 6 – Weyburn</td>
<td></td>
</tr>
<tr>
<td>Month</td>
<td>1 – January* 7 – July</td>
<td>Observation month</td>
</tr>
<tr>
<td></td>
<td>2 – February 8 – August</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 – March 9 – September</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4 – April 10 – October</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 – May 11 – November</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6 – June 12 – December</td>
<td></td>
</tr>
<tr>
<td>Extra Saturday</td>
<td>Yes, No</td>
<td>Indicator for months which contain a fifth Saturday</td>
</tr>
<tr>
<td>Unemployment Rate</td>
<td>Yes, No</td>
<td>Labour Force Survey estimate for Saskatchewan</td>
</tr>
<tr>
<td>Legislative Changes</td>
<td>Yes, No</td>
<td>Presence or absence of legislative changes</td>
</tr>
<tr>
<td>EOD Program</td>
<td>Yes, No</td>
<td>Presence or absence of EOD program</td>
</tr>
<tr>
<td>RID Program</td>
<td>Yes, No</td>
<td>Presence or absence of RID program</td>
</tr>
</tbody>
</table>
## (Partial) Model Output

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Estimate</th>
<th>Standard Error</th>
<th>95% Confidence Interval</th>
<th>Z Score</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-2.9578</td>
<td>0.1001</td>
<td>-3.1540 to -2.7616</td>
<td>-29.55</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Extra Saturday</td>
<td>0.0933</td>
<td>0.0391</td>
<td>0.0165 to 0.1700</td>
<td>2.38</td>
<td>0.0172</td>
</tr>
<tr>
<td>EOD Program</td>
<td>-0.1927</td>
<td>0.0418</td>
<td>-0.2746 to -0.1109</td>
<td>-4.62</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>RID Program</td>
<td>-0.2149</td>
<td>0.0526</td>
<td>-0.3181 to -0.1118</td>
<td>-4.08</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>
Interpretation

• Decrease of 18 per cent in the rate of AR casualty collisions associated with EOD.

• In the six communities under study, an estimated 379 AR casualty collisions were prevented through EOD.

• RID associated with a decrease of 19 per cent in the rate of AR casualty collisions.

• An additional estimated 79 AR casualty collisions prevented by RID.

• Collision reductions were more substantial in larger communities.
Cost Benefit Analysis

• NB model was used to estimate collision counts for each community…no program in effect, EOD only, EOD and RID.

• Benefits reflect estimated collision savings based on average collision cost.

• Costs include funding for overtime, sign installation, promotional materials, advertising, etc.
# Cost Benefit Analysis - EOD

<table>
<thead>
<tr>
<th>City</th>
<th>Costs</th>
<th>Benefits</th>
<th>Benefit-Cost Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regina</td>
<td>$766,121</td>
<td>$6,104,405</td>
<td>7.97 to 1</td>
</tr>
<tr>
<td>Saskatoon</td>
<td>$697,690</td>
<td>$3,345,547</td>
<td>4.80 to 1</td>
</tr>
<tr>
<td>Prince Albert</td>
<td>$327,000</td>
<td>$658,049</td>
<td>2.01 to 1</td>
</tr>
<tr>
<td>Moose Jaw</td>
<td>$261,200</td>
<td>$382,849</td>
<td>1.47 to 1</td>
</tr>
<tr>
<td>Estevan</td>
<td>$128,000</td>
<td>$91,317</td>
<td>0.71 to 1</td>
</tr>
<tr>
<td>Weyburn</td>
<td>$93,000</td>
<td>$91,317</td>
<td>0.98 to 1</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$2,273,011</strong></td>
<td><strong>$10,673,484</strong></td>
<td><strong>4.70 to 1</strong></td>
</tr>
</tbody>
</table>
## Cost Benefit Analysis - RID

<table>
<thead>
<tr>
<th>Year</th>
<th>Costs</th>
<th>Benefits</th>
<th>Benefit-Cost Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>$87,315</td>
<td>$447,960</td>
<td>5.13 to 1</td>
</tr>
<tr>
<td>2011</td>
<td>$224,470</td>
<td>$949,034</td>
<td>4.23 to 1</td>
</tr>
<tr>
<td>2012</td>
<td>$79,866</td>
<td>$1,017,687</td>
<td>12.74 to 1</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$391,651</td>
<td>$2,414,681</td>
<td>6.17 to 1</td>
</tr>
</tbody>
</table>
Conclusions

- Study has produced positive results, both EOD and RID are associated with decreases in AR casualty collisions.
  - EOD – 18 percent reduction, 379 collisions prevented
  - RID – 19 per cent reduction, 79 collisions prevented
- Legislative changes were not significant at the community level, but this is likely due to the specific and localized nature of the analysis.
- Unemployment rate was also not significant, may have been a limitation of the data.
Recommendations

1. Continue funding EOD in Regina and Saskatoon;

2. Re-evaluate the EOD strategy for smaller cities and rural areas;

3. Continue RID program with a focus on ongoing awareness; and,

4. Establish consistent data collection requirements from law enforcement agencies.
Questions?

Thank You!