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Evidence Synthesis on the Impact of Demerit Point Systems in Reducing Road Traffic Injuries and/or Fatalities

Key Findings

- Which traffic violations are assigned points can differ greatly between countries to fit their specific needs, e.g., Austria only includes 13 offenses while Germany includes almost 1,300.[1]
- The relative severity assigned to each violation is often determined by the types of offenses that are most prone to cause crashes or injuries, e.g., drink driving is often given the highest point level.[2]
- The severity of punishments that are enforced determines the effectiveness of the Demerit Point System (DPS). A study in Canada found that fear of losing one's license led drivers to be more careful on the road.[3]
- The implementation of DPS in Veneto, Italy prevented 1,545 fatalities and 91,772 injuries in just 18 months.[4]
- The positive effects of DPS on road traffic crashes, injuries, and fatalities may taper off after 12 to 18 months as a result of inconsistencies in implementation.[5]

Recommendations

- Include violations that are linked to negative outcomes (e.g., speeding, drink driving, lack of helmet and seat-belt use) and assign higher point values for more severe infractions.
- Increase the severity of deterrence measures for repeat offenders.
- Invest in resources to ensure continued program implementation, considering the long-term positive impact of the DPS program.
- Pair implementation of DPS with coordinated awareness and enforcement campaigns.

The Problem

DPS has been successfully implemented in a number of European countries including, Italy, Spain, Ireland, among others. This systems is also implemented in several non-European countries including, Canada, United States, China, the United Arab Emirates, among others. The details of these various DPS, however, vary considerably from country to country.[5] Some of the important considerations that vary among countries are which traffic violations are assigned points, the relative severity assigned to each violation, what type of punitive measures should be used, and at what point threshold should they be used. Despite these variations in implementation, there is relative consistency in the results of these systems. However, the long-term success of these programs varies, with some studies showing a tapering off of effects after around 12 to 18 months.[5] The inconsistencies in the long-term effects can be attributed to the inconsistencies in implementation.

What we already know

In the application of DPS, when a driver accrues a certain number of points, they are assigned punitive measures, such as corrective driving classes, license suspension, or license revocation and there are often opportunities to reset point levels. Infractions such as speeding, drink driving, and lack of helmet and seat-belt use are given point values based on their severity. Specific implementation strategies vary, but offenses that are most likely to result in serious injury or fatality (such as, drink driving) are assigned the highest point value. Most DPS also includes provisions that allow for the reduction of penalty points after sustained periods of safe driving.

Aim of the Review

The aim of the review was to summarize the literature on DPS and identify some of the DPS features that contribute to both initial and sustained success in reducing road traffic injuries (RTIs) and/or fatalities. This review was conducted to synthesize current evidence of DPS.

Articles that included evidence on the effectiveness of DPS in reducing RTIs and/or fatalities and its impact on high-risk road safety factors i.e., speeding, drink driving, and lack of seat-belt use were included. There was no limitation to the geography of the review. Studies that were not in English, had only educational, or behavioral interventions, and opinion pieces were excluded.

Summary of Evidence

This report presents key findings on the positive impact of DPS in reducing RTIs and/or fatalities. The findings also include instances, although few, where DPS was not effective. Most studies measured outcomes such as injuries and fatalities rather than intermediate outcomes such as driver behavior, and this analysis attempts to distill data pertinent to fatalities and/or injuries collated from all the studies.

The literature reviewed indicate strong initial effects of DPS resulting in reduced RTIs, fatalities, and behavioral risk factors (though, there were fewer papers with this as an outcome). Fewer studies were available on the long-term effects of DPS, methods to sustain the initial impact of DPS, and overall costs of implementing the system.

The positive initial effects of DPS can likely be enhanced and prolonged when coupled with increased enforcement and awareness campaigns. However, the initial impact of point systems is not always sustained and can wear off anywhere between six months to two years after, without being reinforced with enforcement and awareness campaigns, which could be costly.

The following tables summarize the evidence of the impact of DPS on RTIs, fatalities and behavioral risk factors.

Impact of DPS on behavioral risk factor(s)

RISK FACTOR	OUTCOME
Drink driving	1. The relative number of drunk versus sober drivers at night decreased after the implementation of the DPS in Spain—reductions between 10% and 30% during nighttime hours were observed.[6]
Seat-belt use	1. Observed seat-belt use in Italy increased by 52% in the 18 months following the implementation of DPS.[4] 2. The prevalence of seat-belt use increased from 54% among drivers and 53% among passengers before implementation of DPS to 83% and 76%, respectively, after implementation.[4]

Impact of DPS on reducing fatalities/injuries

COUNTRY OF IMPLEMENTATION	OUTCOME
Italy	1. DPS resulted in an estimated 18% reduction in fatalities and 19% reduction in RTIs in the 18 months following adoption of the program.[4] 2. The introduction of DPS led to a 12% decrease in RTIs in the emergency department.[7]
Spain	1. Following the implementation of DPS, the relative risk (RR) of serious RTIs decreased for both men and women (RR men and women = 0.9).[8] 2. In addition, there was an estimated reduction of 15% among fatalities in the 18 months following the introduction of the DPS.[9] 3. An initial 13% reduction in the number of highway crash fatalities was noted following the implementation of DPS, but this disappeared after around two years.[10] 4. In a recent study, the fatality rate reduced by 17% after DPS was implemented, and the success of the program continued over three years, with the authors attributing the sustained success to coupling the program with enhanced enforcement.[11]
Kuwait	1. There was a 15% estimated reduction in RTIs in the 42-month post-DPS period.[12]

An instance where DPS was ineffective

- In the Czech Republic, authors posit that DPS has been ineffective in decreasing recidivism for traffic violations including speeding, and lack of seat-belt use.[13] Similarly, another study found that drivers with previous penalty points had a higher probability of incurring more points, suggesting limited deterrence effects.[14]

References

1. Klipp, S., Machata, K., & Van Schagen, I. (2013). The EU BestPoint project: getting the best out of a demerit point system. https://trid.trb.org/view/1286892
2. Farchi, S., Chini, F., Rossi, P. G., Camilloni, L., Borgia, P., & Guasticchi, G. (2007). Evaluation of the health effects of the new driving penalty point system in the Lazio Region, Italy, 2001-4. *Injury Prevention*, 13(1), 60–64. https://doi.org/10.1136/ip.2006.012260
3. Pinquet, J. (2011). "Incentive Mechanisms for Safe Driving: A Comparative Analysis with Dynamic Semiparametric Analysis of Non-Life Insurance Data View Project Charles Vanasse TD Asset Management." https://doi.org/10.2307/23015930
4. Zambon, F., Fedeli, U., Visentin, C., Marchesan, M. T. N., Avossa, F., Brocco, S., & Spolaore, P. (2007). Evidence-based policy on road safety: the effect of the demerit points system on seat belt use and health outcomes. *Journal of Epidemiology and Community Health*, 61(10), 877–881. https://doi.org/10.1136/jech.2006.057729
5. Castillo-Manzano, J. I., & Castro-Nuño, M. (2012). Driving licenses based on points systems: Efficient road safety strategy or latest fashion in global transport policy? A worldwide meta-analysis. *Transport Policy*, 21, 191–201. https://doi.org/10.1016/j.tranpol.2012.02.003
6. Rodríguez-López, J., Rebollo-Sanz, Y. F., & Mesa-Ruiz, D. (2019). Hidden figures behind two-vehicle crashes: An assessment of the risk and external costs of drunk driving in Spain. *Accident Analysis & Prevention*, 127, 42–51. https://doi.org/10.1016/j.aap.2019.02.017
7. Bourgeon, J., & Picard, P. M. (2007). Point-record driving licence and road safety: An economic approach. *Journal of Public Economics*, 91(1–2), 235–258. https://doi.org/10.1016/j.jpubeco.2006.05.007
8. Novoa, A., Pérez, K., Santamariña-Rubio, E., Marí-Dell'Olmo, M., Ferrando, J. E. P., Peiró, R., Tobias, A., Zori, P., & Borrell, C. (2010). Impact of the Penalty Points System on Road Traffic Injuries in Spain: A Time–Series Study. *American Journal of Public Health*, 100(11), 2220–2227. https://doi.org/10.2105/ajph.2010.192104
9. Pulido, J. S., Lardelli, P., De La Fuente, L., Flores, V. M. H., Vallejo, F., & Regidor, E. (2009). Impact of the demerit point system on road traffic accident mortality in Spain. *Journal of Epidemiology & Community Health*, 64(3), 274–276. https://doi.org/10.1136/jech.2008.082461
10. Castillo-Manzano, J. I., Castro-Nuño, M., & Pedregal, D. J. (2010). An econometric analysis of the effects of the penalty points system driver's license in Spain. *Accident Analysis & Prevention*, 42(4), 1310–1319. https://doi.org/10.1016/j.aap.2010.02.009
11. Martínez-Gabaldón, E., Martínez, I. M., & Martínez-Pérez, J. (2020). Estimating the impact of the Penalty Point System on road fatalities in Spain. *Transport Policy*, 86, 1–8. https://doi.org/10.1016/j.tranpol.2019.11.003
12. Akhtar, S., & Ziyab, A. H. (2013). Impact of the Penalty Points System on Severe Road Traffic Injuries in Kuwait. *Traffic Injury Prevention*, 14(7), 743–748. https://doi.org/10.1080/15389588.2012.749466
13. Advances in Intelligent Systems and Computing. (n.d.). Springer. http://www.springer.com/series/11156
14. Dong, H., Jia, N., Tian, J., & Ma, S. (2019). The effectiveness and influencing factors of a penalty point system in China from the perspective of risky driving behaviors. *Accident Analysis & Prevention*, 131, 171–179. https://doi.org/10.1016/j.aap.2019.06.005