ABSTRACT

Background: Motor vehicle crashes are the leading cause of teenage deaths in the United States. Graduated Driver Licensing (GDL) policies effectively decrease teenage crash deaths. Emerging research is identifying the most effective components of GDL. This study examines GDL policies across 6 Great Lakes states, describing the beneficial impact, and investigating how evidence-based policy modifications could further reduce teenage driving deaths and injuries.

Methods: GDL policies were reviewed in 6 Great Lakes states (Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin). Incidence rate ratios for fatal and injury crashes for 16-year-old drivers were obtained from the Nationwide Review of GDL Study. Ratios were applied to the fatal and injury crashes reported from each state between 2002 and 2006 for 16-year-old drivers. The potential impact (crashes avoided) for each state was determined based on the state using a 3-phase GDL policy (a learner and intermediate stage prior to full licensure). In addition, the impact on crash reductions for each state if they had employed 5 of the recommended GDL components was determined.

Results: All 6 states had a 3-phase GDL policy, resulting in potential avoidance of 124 fatal and more than 21,000 injury crashes. The 6 states had 1 to 3 of the qualifying GDL components. If these states had adopted 5 of the qualifying components, an additional 309 fatal and more than 27,000 injury crashes could have been avoided.

Conclusion: Three-phase GDL policy is effective at saving the lives of teenage drivers and vehicle occupants; evidence-based modification of GDL has the potential to further reduce teenage motor vehicle crash deaths and injuries.

INTRODUCTION

Getting a driver’s license as a teenager is an important part of American culture and an anticipated event preceding adulthood. Factors such as a teenagers’ emerging maturity and judgment — and their distractibility — can be unfortunate attributes when having to learn the complex process of operating an automobile. Motor vehicle crashes remain the No. 1 cause of teenage deaths in our country.1 State Graduated Driver Licensing (GDL) regulations have proven to be an effective policy intervention to reduce teen-driving deaths and are now active in 47 states and the District of Columbia.2-3 GDL outlines a 3-phase process intended to address the driving risks teens face as they transition from being novice drivers to intermediate and experienced drivers. The “learner” phase specifies a minimum age for obtaining a learner’s permit, hours of supervised driving hours, and imposes a certain length of time prior to progressing to the “intermediate” phase. The intermediate phase limits teen driving to specific conditions aimed at further reducing risk; examples include nighttime driving restrictions and limitations on the number of peer passengers in the car. When a teen has successfully completed the first 2 phases and reached a minimum age, conditions are lifted and full licensure is granted. The “components” that shape each phase of the GDL process, such as minimum age for obtaining a learner’s permit, hours of supervised driving, passenger restrictions, and age when full license may be granted, vary from state to state.
Baker, Chen, and Li, in association with the American Automobile Association’s Foundation for Traffic Safety, published the “Nationwide Review of Graduated Driver Licensing” (NR) that compared the effectiveness of the various state regulations. They used their findings as evidence for how to develop a policy of best practices for GDL regulations. The NR analyzed the impact of a reduction in fatal and injurious crashes for 16-year-old drivers across states with 3-phase GDL policies, and demonstrated the benefits of including up to 7 best-practice qualifying “components” within a given GDL regulation (Table 1). None of the states analyzed as part of Baker’s study had more than 5 of the recommended components.

The outcome of the NR demonstrated that 3-phase GDL laws reduce fatal crashes for 16-year-olds by 11% and injury crashes by 19%. The NR also found that there is a 38% reduction in fatal crashes when 5 of the recommended components are in place, a 21% reduction in fatal crashes among states with 4 recommended components, and no change in fatal crashes when ≤3 components are part of the law. The NR found a 40% reduction in non-fatal injury crashes in states with 5 recommended components in their GDL policies, a 36% reduction in states that incorporated 4 components, and only a slight reduction in states that included 2 or 3 components in their policies.

Our study uses the results from the NR to explore how GDL has helped reduce fatal and injury crashes among 16-year-old drivers in Great Lakes Region states (Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin). Additionally, this study assesses what further gains might be made by strengthening GDL policy based on emerging evidence. The objective is to translate the research published in the NR study to the specific context of GDL policies in the 6 states, thereby allowing local policymakers the opportunity to evaluate current regulation and understand how moving toward a stronger, evidence-based policy could further benefit the communities they serve.

### METHODS

We reviewed the GDL policies of the 6 states in the Great Lakes region. We then obtained annual motor vehicle crash fatality and injury data in which at least 1 of the vehicles involved in the crash was driven by a 16 year old. Data were obtained for the 2002-2006 period, but injury crash data from Indiana in 2002 and Minnesota in 2003 were not available; an average value of the other 4 years for each of these states was used in place of the missing incidence data. Sources for crash data are listed in Table 2. The GDL policy of each state was examined for the presence or absence of a 3-phase graduated licensing program. The number of specific qualifying components defined in the NR during the study time frame was also determined. A state was only...
RESULTS

From 2002-2006, all 6 states used 3-phase GDL policies. Four states—Michigan, Minnesota, Ohio, and Wisconsin—employed 3 of the 7 NR components in their programs; Illinois employed 2 and Indiana 1 (Table 3). Figure 1 depicts the number of fatal crashes avoided due to each state having a 3-phase GDL regulation and the predicted reduction if states were to increase the number of components in their programs from their current baseline to 4 or 5 of the NR components over the 5 years analyzed. For the Great Lakes region, as a whole, the 3-phase GDL policies currently in use potentially avoided 124 fatal crashes from 2002-2006. Also, a predicted 309 fatal crashes could have been avoided if all states had GDL programs with 5 of the NR components. The calculations for injury crashes by 16-year-old drivers is also striking (Figure 2), with 21,359 injury crashes avoided due to using a 3-phase GDL program in each of the states. An additional 27,820 injury crashes could have been avoided if a 5-component system had been used across the region.

DISCUSSION

The development and implementation of GDL policies in the United States, beginning in the mid-1990s, is credited with helping decrease motor vehicle crashes.
developmental findings may be due to ongoing growth changes within the normal brain and are beyond a teen’s control.  

Policymakers should be credited for the number of lives preserved as a result of GDL legislation. Our study indicates 124 fatal crashes and more than 21,000 injury crashes have been avoided in the Great Lakes region alone due to 3-phase GDL programs. Historically, research has supported the basic principles behind GDL policy. Decision-makers can partner with the research community to modify current GDL policies as new science is developed. Our study lends support for states moving to include more of the best-practice components noted in the NR and included within the Insurance Institute For Highway Safety recommendations for state GDL regulations. More than 27,000 teenage motor vehicle crashes could have been avoided with the use of strengthened GDL policies in the Great Lakes region over the 5 years evaluated in this study. This could be viewed as a “policy treatment prescription,” capable of keeping teenagers alive and families intact; an “evidence-based policy” akin to “evidence-based medicine.” States such as Illinois and Minnesota are modifying their GDL policies to reflect emerging research and adding components such as cell phone or electronic device bans. These components relating to further distractions, while not validated, are strongly supported by what we now know about teenage neurologic developmental research. 

Policymakers may be reluctant to modify GDL laws due to the prevalent driving culture in our society, as well as the potential impact that delayed independent teenage driving might have on a family. These cultural and practical issues must be weighed against the lifesaving benefits offered by enhanced GDL policies. GDL regulations are effective because of the partnership between policymakers, teenagers, researchers, and parents. Parents are key participants in the GDL process, and tend to support GDL.

CONCLUSION

We note that our study has methodological limitations. We have used the available national IRR values, but it is conceivable that regionally specific values could differ. Also, our time frame (2002-2006) differs from that of the NR (1994-2002). Although the NR did control for secular trends, such trends are not separated in our incidence data. Even with these limitations, our study remains a reasonable demonstration of how evidence-based policy can save lives. We encourage decision-makers to use current and emerging research
to strengthen their GDL regulations to further assist teenagers in becoming safe drivers. These modifications to current policies could reduce the burden of injury and death that motor vehicle crashes by teens present in our communities.

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REFERENCES


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