# The Effectiveness of Child Safety Seat Laws in the Fifty States

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ABSTRACT

This study evaluates the effectiveness of state child safety seat laws in the United States. Data for all fifty states for the period 1975 to 1994 are used. Pooled time series analysis is employed to estimate a model of the rate of fatalities suffered by children ages 0-5 years as occupants in automobile crashes. The occupant fatality rate for children 6-11 years of age is used as a comparison group to control for other trends not introduced in the estimated models. The results show that child safety seat policies have significantly reduced fatality rates among children 0-5 years of age. For each additional year of age covered by a state statute, this fatality rate drops 4.8%. A similar reduction in the fatality rate of the older age cohort (6-11 years old) was not observed.

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## INTRODUCTION

Injuries remain the leading cause of death among children in the United States, with motor vehicle accidents the most common source of these injury deaths (Waller, Baker, and Szocka, 1989; National Safety Council, 1993). Since 1975, over 15,000 children ages 0-5 years have died as occupants in motor vehicle crashes in the nation. In 1994 alone, 772 children in this age group died in this manner.[1]

An effective measure for reducing the risk of fatal or serious injury to young passengers in motor vehicle crashes is the use of child safety seats (Agran, Dunkle, and Winn, 1985). When properly used, these devices can reduce child fatalities by 71 percent (Kahane, 1986). Because of this potential to save lives, states have actively promoted their use with child passenger protection legislation. During the period from 1978 to 1985 every state in the nation implemented a law mandating the use of child safety seats with varying age limits. Although these laws have been in effect for over a decade, insufficient research has been conducted to evaluate their effect on traffic safety across time.

This analysis evaluates the impact of laws mandating the usage of child safety seats for all fifty states from 1975 to 1994. Through the use of pooled time series analysis this study examines the rate of fatalities suffered by children ages 0-5 years who were occupants in motor vehicle crashes. The occupant fatality rate for children 6-11 years of age provides a comparison group to control for other trends not introduced in the estimated models. In addition, demographic, economic, and other traffic safety policy variables function as control variables in these models.

## CHILD PASSENGER RESTRAINT LEGISLATION

On January 1, 1978, Tennessee became the first state in the nation to implement a law requiring the use of safety seats for children who are passengers in motor vehicles. Rhode Island and West Virginia were the next to follow, implementing child safety seat laws in July of 1980 and 1981, respectively. By 1985 all fifty states had enacted such laws (NHTSA, 1993).

Although all states have implemented child restraint laws, these statutes vary considerably in their coverage. As of 1994, 5 states required child safety seats to be used only for children under the age of 2 years and only 10 states mandated the use of such a restraint for children under the age of 5. Alabama was the only state whose law applied to all children under the age of 6 years. Beyond age of coverage, state statutes vary with respect to the situations that child safety seats must be used. Several exemptions have been allowed in some states: children in vehicles not registered in the state, children traveling with out-of-state drivers or someone other than a parent or legal guardian, back seat passengers, or certain vehicle types (e.g., taxis) (Teret, Jones, Williams, and Wells, 1986).

Evaluations of these statutes have been conducted on an individual state-by-state basis and generally report positive safety impacts. For instance, implementation of these laws has been credited with a rise in the overall use and an increase in the proper use of child safety seats (Williams and Wells, 1981a, 1981b). In some states, the number of injuries suffered by children of the ages covered by child restraint laws have decreased after a law's implementation (Decker, Dewey, Hutcheson, and Schaffner, 1984; Guerin and MacKinnon, 1985). Other studies have found these policies to be more effective in reducing moderate and less severe injuries as compared to serious injuries (Wagenaar, 1985; Wagenaar and Webster, 1986).

When the effect of child restraint policies on fatalities is examined, however, the impact of these laws is not as clear. Tennessee experienced a reduction in the number of fatalities suffered by the covered age group after such a law was implemented (Decker et al., 1984). Similarly, the Illinois child restraint use law is credited with reducing injuries and fatalities of children ages 0-5 years (Rock, 1996). In contrast, implementation of the California (Guerin and MacKinnon, 1985) and Michigan laws (Wagenaar and Webster, 1986) was not followed by statistically significant reductions in fatalities among children covered by the statutes. These inconsistent results regarding fatalities are not surprising in the context of individual state analyses. Definite trends in fatalities for affected age groups following the implementation of these laws are difficult to determine given the small number of fatalities among young children in a single state and the short post-law time periods typically studied.

Two studies have examined the safety effects of child occupant protection legislation throughout all states. For the period 1981 to 1984, Partyka (1989) compared child fatalities of states with these laws to those without them, and concluded that these statutes reduced child fatalities by 9%. Using OLS regression based on a Poisson distribution covering 1976 to 1986, Evans and Graham (1990) estimate that child restraint use legislation reduced child occupant fatalities by 39% for infants and 30% for toddlers. The study reported below provides a pooled time series analysis of the experience of all fifty states and does so by covering a longer time period and introducing other traffic safety policies as control variables in the estimated models.

## DATA AND METHODS

Using data from 1975 to 1994 for all fifty states, we conduct a pooled time series analysis. The dependent variable is the fatality rate (number of fatalities per billion vehicle miles traveled[2]) suffered by children as occupants in motor vehicle crashes. Separate models are estimated for fatality rates in two age groups: 0-5 and 6-11 years of age.

A state's child passenger protection law is operationalized in two forms. First, a dummy variable represents the presence or absence of a state law mandating the use of safety seats for young passengers in motor vehicles.[3] Second, the policy is represented by the ages of coverage stipulated in the statute. For example, a state is assigned a value of "1" if it applies to children only under one year of age, "2" if it covers all children under two years of age, up to a value of "6" if all children under six years must use a safety seat. A value of "0" is used for those years when a state does not have such a law implemented for at least six months.[4]

We expect the implementation of a law mandating the use of child safety seats will improve the safety of only those motor vehicle passengers covered by the statute. Thus, the presence of a mandatory child safety seat law should decrease the fatality rates observed for children ages 0-5 years, but it should not be correlated with a reduction in the fatality rates of children not covered (i.e., 6-11 year olds). Employing a comparison group of 6-11 year old occupants helps control for history threats. This age cohort represents the best comparison for young children regarding exposure to risk of a motor vehicle fatality both in terms of traveling patterns and body structure. If a significant negative relationship exists between child safety seat laws and the fatality rates of children ages 6-11 years, then non-modeled policies or trends may account for the observed reduction in the fatality rates of covered passengers.

Several additional variables that affect traffic safety are introduced as control variables. Without much previous non-experimental research on child traffic fatality rates, little is known about what control variables to employ in a pooled time series model encompassing all fifty states. Thus, we employ control variables commonly used in studies of fatality rates involving all motor vehicle passengers.

It is likely, however, that children have a different exposure to risk in motor vehicle crashes than passengers in other age categories. First, children have skeletal systems that make them more susceptible to serious injuries when involved in a motor vehicle crash. Second, children are more likely to be passengers during the day and on shorter trips. Third, children are less likely to be passengers during the middle of the night when alcohol related fatalities are more likely to occur. These patterns suggest that children are less likely to be involved in a serious crash, but are at greater risk when a crash occurs. Therefore, we would not be surprised if these control variables exhibit different patterns in this study than found in more general studies on traffic fatality rates.

Two policy variables that affect traffic safety are included in these models. First, the minimum legal drinking age (MLDA) for a state is operationalized as the youngest age that a person can obtain any form of alcohol.[5] Second, a dummy variable is included that is coded as "1" for any year in which a state had a maximum speed limit of 65 mph on rural Interstate highways by July 1.[6] We hypothesize that a higher MLDA reduces state traffic fatalities while the adoption of a 65 mph speed limit increases these rates (Saffer and Grossman, 1987; Wagenaar, Streff, and Schultz, 1990; Baum, Wells, and Lund, 1991; O'Malley and Wagenaar, 1991; Houston, Richardson, and Neeley, 1995, 1996).

Third, policies requiring older children to use seat belts must also be introduced in the models for occupant fatalities of 6-11 year olds. In addition to mandating the use of safety seats for the youngest passengers in motor vehicles, child passenger protection legislation may specify the use of seat belts by these older children. Further, the adoption of mandatory seat belt laws for passengers regardless of age could also reduce fatalities among the 6-11 year old age group. These policies are represented by a dummy variable, indicating that seat belts are required for at least some 6-11 year old passengers.

Additionally, several demographic, economic, and climactic control variables are included in these models. First, we expect that the more children in an age group within a state, measured as a percentage of total population, the higher the fatality rate for that cohort. Second, population density, measured here as population (in thousands) per square mile, has been negatively associated with traffic fatalities as traffic in more populated areas moves at slower speeds, resulting in fewer serious crashes (Phillips, Ray, and Votey, 1984; Baker, Whitfield, and O'Neill, 1987; Zlatoper, 1991; Houston et al., 1995). Third, to control for the proportion of young, inexperienced drivers in a state, we use as a proxy the percentage of the adult population that falls in the 18 to 24 age category. This variable is hypothesized to be positively related to fatality rates (Saffer and Chaloupka, 1989; Zlatoper, 1991; Chirinko and Harper, 1993; Houston et al., 1996).

Fourth, state alcohol consumption has also been found to be positively related to motor vehicle fatalities (Chirinko and Harper, 1993; Legge and Park, 1994; Houston et al., 1996), and it is measured as total consumption in gallons per capita.[7] Fifth, warmer climates are correlated with higher rates of motor vehicle fatalities, as warmer temperatures increase the opportunity to travel and contribute to driver fatigue (Evans, 1991; Zlatoper, 1991; Legge and Park, 1994). To operationalize climate, we use a measure of the normal daily mean temperature for each state.[8] Finally, personal income is hypothesized to be negatively related to motor vehicle fatalities as higher income groups will have a higher demand for safety (Asch and Levy, 1987; Saffer and Chaloupka, 1989; Chirinko and Harper, 1993; Legge and Park, 1994; Houston et al., 1996). Income per capita (in constant dollars) for each state serves as the income measure for this study.[9]

This analysis is estimated with a pooled time series routine assuming a fixed effects model (using the Panel procedure in TSP). In this model, the coefficients for the independent variables are assumed to be constant across cross-sections, while each cross-section has a unique intercept (hence, the fifty state intercepts are not reported below) (Hsiao, 1986). The appropriateness of a fixed effects model for the data was assessed with two statistical tests. First, an *F*-test comparing an OLS regression on the entire sample versus a fixed effects model was conducted (null hypothesis: OLS = fixed effects). Second, a Hausman specification test compares a random effects model (the null hypothesis), assuming unique parameters for the independent variables across each cross-section, with a fixed effects model (Hall, 1996). Both the *F*-test and the Hausman specification test indicate that the fixed effects model is appropriate for all five models reported below. Graphical analysis of the residuals for each model as suggested by Sayrs (1989) and Gujarati (1988) indicate no serious problems with heteroskedasticity or autocorrelation.

## FINDINGS

The results of the pooled time series analysis are presented in Table 1. The fatality rate suffered by children ages 0-5 years serves as the dependent variable for models 1 and 2, while the fatality rate sustained by older children ages 6-11 years is the dependent variable for models 3, 4, and 5. For both dependent variables, models were estimated to test two operational definitions for child safety seat laws (both as a dichotomous and a continuous variable). We first examine the results of the models for fatality rates among young children.[10] The discussion begins with a general description of the performance of the control variables in the models, to be followed by a more complete treatment of the child passenger restraint policy variables.

*Control Variables*

The pattern among the coefficients for the control variables differs slightly between the two sets of models. For models 1 and 2, the percent of the population that are young adults is the only control variable that performs as expected (in a positive direction). Population density is also statistically significant but in the direction opposite of what was hypothesized based on models of all fatalities. Although accidents are more frequent in dense population settings (i.e., urban areas), they occur at slower speeds resulting in fewer serious accidents. Apparently, these accidents in urban areas still pose considerable threat to young children due to their small stature and undeveloped skeletal system (a risk that older children do not face, see models 3-5). In models 3, 4 and 5, the percent of the population age 6-11 years and the percent of the population who are young adults are positively related to fatality rates of 6-11 year olds, as hypothesized. None of the other control variables in these models illustrate a consistent pattern of statistical significance. Apparently, the environmental factors contributing to the risk of a traffic fatality for young children are different than those affecting the entire population.

(Place Table 1 about here.)

The coefficients for the alcohol consumption and minimum legal drinking age variables generally are not statistically significant in these models. This may be a function of the time of day when children are likely to be passengers in motor vehicles because alcohol-related traffic crashes are more likely to occur during nighttime hours (NHTSA, 1995:110). If children are more likely to be passengers during daytime hours, they would be at lower risk of involvement in an alcohol-related crash, making these variables unimportant in explaining child fatalities. This explanation is borne out by data on alcohol-related fatalities, as in 1991 only 17% of fatalities among children under the age of 16 involved a driver or non-motorist with a blood alcohol concentration (BAC) of 0.10 (grams per deciliter) or greater. In contrast, 40% of fatalities among all other ages involved an individual with a BAC of 0.10 or greater (NHTSA, 1993:163). Furthermore, in 1991 nine percent of drivers in a daytime fatal crash had a BAC at or above 0.10, while 38% of drivers in nighttime crashes had a BAC in this range (NHTSA, 1993:110). With this in mind, it is surprising that MLDA is statistically significant, and in a positive direction, in model 1.

The coefficients for the 65 mph speed limit variable are statistically significant only in model 2, but approach statistical significance in the other four models, albeit in a negative direction. While this pattern is contrary to what was hypothesized, it corroborates the findings reported by Lave and Elias (1994) and Houston (1999). These scholars suggest that higher rural interstate speed limits divert faster traffic to these roads and away from other roads that are more dangerous. Although the fatality rate on rural interstate highways may increase, it is more than offset by the reductions in fatalities on all other road types.

*Child Safety Seat Policy Variables*

Most importantly, the presence of a law mandating the use of child safety seats for young passengers has a statistically significant impact on the rate of fatalities these young children experience. In both operationalizations, child safety seat laws substantially reduce the fatality rate among children ages 0-5 years. The dummy variable in model 1 indicates that the simple presence of such a law reduces these child fatalities. Furthermore, model 2 shows that each additional year of coverage saves additional lives.

*Comparison Group Analysis*

To control for other policies or trends not accounted for in the previous two models, occupant fatalities for children ages 6-11 years serve as a comparison group. This slightly older age cohort is the segment of the population that is the most similar to children 0-5 years of age but is not covered by mandatory child safety seat legislation.

Neither the safety seat dummy nor the age coverage variable are statistically significant determinants of occupant fatality rates for children ages 6-11. This is as expected, given that this older cohort is not covered by child safety seat laws. Taken in combination with the results reported for models 1 and 2, this finding indicates that children 0-5 years of age have indeed experienced a decline in fatality rates associated with the implementation of child safety seat laws that the older age cohort has not.

Surprisingly, the dummy variable representing other mandatory safety restraint policies among those ages 6-11 is not related to occupant fatality rates for this group. In models 3, 4, and 5, this variable is consistently negative but not statistically significant. To test for possible multicollinearity between the youth restraint and the child safety seat variables, model 5 reports results of a model that omits both measures of child safety seat legislation. Given the consistent performance of the youth restraint variable in all three models, these policy variables are not substantially collinear.

Two findings in previous research may explain why policies requiring the use of restraints (typically seat belts) by 6-11 year old youths in motor vehicles are not effective. First, restraint usage rates by children decline as they grow older (Williams and Wells, 1981a; Decker et al., 1984). Second, while there are some safety gains for a child wearing a seat belt, the benefits are not comparable to those experienced by adults for whom these restraints were designed (Agran, Castillo, and Winn, 1992).

*Policy Implications*

These findings indicate that child safety seat laws are effective in encouraging adults to place young children in safety seats while they are passengers in motor vehicles. From a substantive perspective, these laws have saved young lives. For all years in which child safety seat laws have been in place, we estimate that these laws have reduced young child fatalities by 18.1%.[11] This amounts to 1,840 child fatalities that were averted.  For 1994 alone, we estimate that these laws averted 184 deaths of children ages 0-5 years.

Furthermore, the larger the age cohort covered by a child safety seat law, the more lives that are saved.  Each additional year of age that is covered lowers fatalities by about 4.8%.  As of 1994, only one state law (Alabama) covered all children under the age of six years.  Hence, if every state upgraded its child safety seat law to cover all children under the age of six years, there would have been 103 fewer motor vehicle fatalities for children ages 0-5 years in 1994, or a 14.3% reduction.  To further enhance the safety of these young passengers, states should amend their child safety seat statutes to expand coverage to a wider range of ages.

Table 2 reports the ages of coverage for state child passenger laws for the years 1990 and 1998.  In recent years, states have heeded the advice of traffic safety advocates and have begun to increase the coverage of their statutes.   The most significant change in these statutes has occurred since 1994, the last year of data used in the above analysis. The majority of states now require safety seats to be used by children under 4 years of age.  While this is the age of coverage recommended by NHTSA (NHTSA, 1999d), the results above suggest that child safety would further be enhanced by expanding coverage beyond this limit.

(Place Table 2 about here.)

To encourage states to expand coverage of their laws, enhance enforcement efforts, and increase public education pertaining to child occupant safety, the Federal government has established two grant programs.  Section 405 of the Transportation Equity Act for the 21$^{st}$ Century (TEA-21) (P.L. 105-178) established occupant protection incentive grants to fund occupant protection programs. Among the requirements that states may satisfy to qualify for these grants are the existence of child passenger protection laws that have broad coverage, and significant fines or penalties for violators of these laws (NHTSA, 1999b).

A second incentive grant program created under Section 405 provides funds to states for education, training, and other safety programs designed to enhance child occupant safety (NHTSA, 1999a). These grant programs indicate that the Federal government has moved away from the use of coercive crossover sanctions, such as those employed to co-opt states into adopting a 55 mile per hour speed limit in the 1970s (Baum, Lund, and Wells, 1989), to less intrusive tools that are more acceptable in today's era of devolving policy authority to the states.

## CONCLUSION

To address concerns regarding the safety of child occupants in motor vehicles, states have implemented statutes that require child safety seats to be used by young children. Although these laws were implemented nearly a decade ago, little research has evaluated the effectiveness of these policies to improve the safety of young children as passengers in motor vehicles. To date, most evaluations have been single state studies that examine short post-law time periods. Generally, these studies identify positive safety effects of these statutes. This analysis adds to this literature by examining the impact of child safety seat legislation throughout the fifty states for a twenty year period.

The results of the pooled time series analysis indicate that the implementation of these statutes corresponds to a reduction in the number of motor vehicle fatalities among passengers 0-5 years of age. Furthermore, the broader the range of ages covered by these policies, the greater the reduction in these fatalities. In contrast, these policies are not correlated with a similar decline in fatalities among motor vehicle passengers 6-10 years of age. This suggests that the observed negative relationship between child safety seat laws and occupant fatalities among children ages 0-5 years is not a function of other policies or trends absent from the models estimated above.

Child safety seat laws are effective tools for increasing the safety of young motor vehicle occupants. To further enhance the safety of these young passengers it is recommended that state statutes be amended to expand their coverage. In this respect, Massachusetts serves as a model for other states as it has a statute that requires all children under six years of age to be placed in a child safety seat while passengers in a motor vehicle, permitting no substitution of a seat belt in place of a safety seat.[12]

Additional research needs to focus on the exemptions that are written into these statutes. While the states vary in terms of the ages covered, there is even greater variance in the exemptions that exist among these laws. For instance, seven states exempt vehicles not registered in the state and exempt children of residents from other states from their laws (Insurance Institute for Highway Safety, 1999). One would expect that any exemption from coverage under these laws militate against their effectiveness. In March 1999 NHTSA called for states to eliminate exemptions to child safety laws to enhance occupant protection for children (NHTSA, 1999d). Research should catalogue the types of exemptions commonly employed by states and examine the impact that these exemptions have on child safety.

Furthermore, the importance of education and enforcement efforts has yet to be examined. As government and non-profit organizations increase efforts to educate the public about the importance of car seat use for kids, it is important to learn which types of messages and which medium have the biggest impact on child safety seat use. Focus groups and surveys of parents of young children should be employed to learn how the message to use safety seats can be communicated most effectively. Attention must also be paid to the enforcement efforts of states to learn what programs do the most to enhance child safety.

## ENDNOTES

[1] These figures were calculated from the Fatal Accident Reporting System (FARS) data set.

[2] The data for vehicle miles traveled are "States' estimated highway travel based on traffic counts taken along selected highway sections which are grouped into categories, or systems, according to the character of service they provide" (Federal Highway Administration, 1993:V-4). In a few cases, the data are estimates calculated by the "Federal Highway Administration based on Highway Performance Monitoring System and other available traffic monitoring data" (Federal Highway Administration, 1993:V-116). Due to the fact that these data are merely estimates generated by different organizations, variance in the estimates is likely to exist. We are not aware of any systematic bias in the reported estimates that would undermine their use. Furthermore, these data are commonly used in studies of this nature to control for differing travel patterns among the states.

[3] A state is assigned a value of “1” for each year that a statute has been implemented for at least six months, and a value of “0” for all other years.

[4] The Kentucky statute mandates the use of a safety seat for children under 40 inches in height. This was coded as applying to all children under 5 years of age, based on the median height for each age as reported in Famighetti (1994).

[5] Any policy change that is implemented by July 1 is coded as the state’s policy for that year.

[6] A rural Interstate highway is considered to be any federally funded Interstate that passes through areas with population of less than 50,000.

[7] This total figure is calculated by summing the products of the consumption of distilled spirits, wine and beer multiplied by the alcohol content of these beverages (40%, 12% and 3.6% respectively).

[8] This variable is reported for selected cities in each state. For states that have more than one city reported, an average of the reported values is taken as the overall state value.

[9] The following data sources were used for this project: *Fatal Accident Reporting System* (child restraint and seat belt policies, fatalities); *Accident Facts* (minimum legal drinking age, 65 mph maximum speed limit); *Statistical Abstract of the United States* (square miles, temperature, income per capita); *Highway Statistics* (population, vehicle miles traveled); *Survey of Buying Power* (percent age 0-5 years, percent age 6-10 years, percent young adults); and *Brewers Almanac* (alcohol consumption).

[10] The recent controversy over the safety hazard that air bags pose for child occupants does not have an appreciable effect on the analysis undertaken in this project. NHTSA has confirmed 1 death of a child in 1993 and 5 deaths in 1994 that were attributed to air bag deployment (NHTSA, 1999c). Child air bag deaths increased in the years following 1994, which are not included in our data. The impact of these deaths is too small to have much bearing on our analysis. However, it is interesting to point out that all 6 air bag deaths of children that occurred in 1993 and 1994 involved children who were not restrained in a rear facing child safety seat.

[11] All estimates are based on calculations using Model 2 reported above. First, we predicted the number of fatalities assuming that no safety seat laws were in effect (i.e., ages safety seat required variable equals zero) for those years in which a state had a law in place. This procedure generated a value that represented the possible number of fatalities that would have occurred in the absence of these laws. Second, we obtained predicted values based on the actual values for this policy for all states in the years such a law was in effect. The predicted number of fatalities with the laws was subtracted from the total possible fatalities without the laws and then divided by the total possible fatalities without the laws. The model predicted 10,186 total fatalities without these laws and 8,346 total fatalities with the state laws in place.

[12] The National Committee on Uniform Traffic Laws and Ordinances (2000) drafted the Child Restraint Use Model Law in 1997, that recommends comprehensive coverage for all children under 4 years. Extending coverage, the National Transportation Safety Board (1996a, 1996b) recommends that states adopt child restraint use laws that cover children up to 8 years old and eliminate exemptions that permit the substitution of seatbelts in place of child restraint systems.

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**Table 1**
**Pooled Time Series Analysis**

| | **Model 1: Fatality Rate 0-5 Years** | **Model 2: Fatality Rate 0-5 Years** | **Model 3: Fatality Rate 6-11 Years** | **Model 4: Fatality Rate 6-11 Years** | **Model 5: Fatality Rate 6-11 Years** |
|---|---|---|---|---|---|
| Percent Age 0-5 Years | -0.009 | -0.018 | -- | -- | -- |
| | (-0.57) | (-1.15) | | | |
| Percent Age 6-11 Years | -- | -- | 0.026 * | 0.026 * | 0.028 ** |
| | | | (2.29) | (2.29) | (2.58) |
| Population Density | 0.198 * | 0.002 * | 0.000 | 0.000 | 0.000 |
| | (2.09) | (2.08) | (0.56) | (0.54) | (0.56) |
| Percent Young Adults | 0.034 ** | 0.040 ** | 0.011 * | 0.012 ** | 0.013 ** |
| | (5.51) | (6.77) | (2.31) | (2.58) | (2.71) |
| Alcohol Consumption | -0.019 | -0.032 | 0.017 | 0.018 | 0.022 |
| | (-0.34) | (-0.57) | (0.38) | (0.39) | (0.48) |
| Temperature | -0.045 | -0.046 | -0.027 | -0.027 | -0.028 |
| | (-1.76) | (-1.83) | (-1.24) | (-1.27) | (-1.31) |
| Income Per Capita | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | (0.71) | (0.70) | (0.61) | (0.58) | (0.45) |
| MLDA | 0.019 * | 0.017 | -0.001 | -0.002 | -0.004 |
| | (2.02) | (1.79) | (-0.18) | (-0.28) | (-0.46) |
| 65 mph Speed Limit | -0.047 | -0.051 * | -0.041 | -0.042 | -0.043 * |
| | (-1.93) | (-2.09) | (-1.84) | (-1.90) | (-1.97) |
| Youth Restraint Dummy | -- | -- | -0.010 | -0.010 | -0.012 |
| | | | (-1.19) | (-1.25) | (-1.58) |
| Safety Seat Dummy | -0.117 ** | -- | -0.026 | -- | -- |
| | (-4.23) | | (-1.19) | | |
| Ages Safety Seat Required | -- | -0.020 ** | -- | -0.004 | -- |
| | | (-3.27) | | (-0.72) | |
| Adjusted $R^2$ | 0.523 | 0.523 | 0.379 | 0.378 | 0.378 |
| N | 1000 | 1000 | 1000 | 1000 | 1000 |
| F-test | 6.87 ** | 7.13 ** | 4.86 ** | 4.87 ** | 4.88 ** |
| Hausman test | 50.20 ** | 51.50 ** | 23.56 ** | 23.90 ** | 23.81 ** |

Numbers in parentheses are *t*-statistics.
* Significant at the 0.05 level.
** Significant at the 0.01 level.

**Table 2**
**State Child Restraint Laws:**
**Ages Safety Seat Required**

| Ages Covered | Year 1990 | 1998 |
|---|---|---|
| Under 1 year | 2 | 0 |
| Under 2 years | 5 | 3 |
| Under 3 years | 12 | 7 |
| Under 4 years | 20 | 27 |
| Under 5 years | 10 | 9 |
| Under 6 years | 1 | 4 |
| TOTAL | 49 | 49 |

* Kentucky's statute requires children under 40 inches in height to use a safety seat and is not included in the above table.

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