Research Report
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ECONOMIC COSTS OF LOW SAFETY BELT USAGE IN MOTOR VEHICLE CRASHES IN KENTUCKY

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ECONOMIC COSTS OF LOW SAFETY BELT USAGE IN MOTOR VEHICLE CRASHES IN KENTUCKY

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EXECUTIVE SUMMARY

By passing legislation in 2006 to mandate primary enforcement of the Kentucky state law requiring safety belt use for motor vehicle occupants, the state could expect to realize an overall savings of at least $118 million in direct medical costs over the ten-year period from 2006 to 2015. Charges to Medicaid over that period would be about $34 million less than under the current secondary enforcement model. In addition, there would be at least $67 million saved in medical costs to commercial insurers, $2.3 million to Medicare, $3.3 million to Worker's Compensation, and $11.2 million to other sources.

These savings would be a direct result of an increase in the number of Kentuckians who would wear a safety belt if a primary enforcement law were in place. States that have enacted primary enforcement legislation in the past have experienced increases in safety belt use of as much as 18 percentage points. The National Highway Traffic Safety Administration (NHTSA) has stated that the average increase is between 10 and 15 percentage points. The savings given above assume that Kentucky would experience an increase of 13 percentage points, which would move the state's usage rate from 67 percent to 80 percent, which was the national average in 2004.

NHTSA has published estimates of the effectiveness of safety belts in preventing fatal and nonfatal injuries. The estimated effectiveness varies depending on the type of vehicle in which the occupant is riding (passenger car versus light truck), the type of safety belt used (lap belt only versus lap and shoulder belt), and the occupant's position in the vehicle (front seat versus rear seat). Linked collision report and hospital discharge data from Kentucky's Crash Outcome Evaluation System (CODES) were used to estimate Kentucky's overall safety belt effectiveness for preventing moderate-to-critical injury at 55 percent. This number was then used to calculate medical costs savings for Kentucky's Medicaid program and other payers that would result from enactment of a primary enforcement law. Particular attention was given to traumatic brain injuries (TBI) and spinal cord injuries (SCI) because they often result in medical costs for years after the original injury.

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1.0 INTRODUCTION

1.1 Total Burden of Motor Vehicle Crashes in Kentucky

In 2004, there were 813 motor vehicle occupants killed in crashes on Kentucky's roadways, and 3,984 treated as inpatients in hospitals in Kentucky[1,2]. These figures exclude motorcyclists, bicyclists, pedestrians, and others involved in motor vehicle crashes (MVC's) for whom safety belt use does not apply. In addition, although the state does not maintain a central database of emergency department (ED) visits statewide, it can be estimated from nationally published statistics that there were approximately 38,000 vehicle occupants treated and released from ED's for MVC-related injuries in 2003, the most recent year of available data[3].

Kentucky's observed safety belt usage rate of 66 percent in 2004 was 14 percentage points lower than the national rate of 80 percent. Correspondingly, Kentucky's MVC fatality rate of 2.1 per million vehicle miles traveled in 2004 was approximately 40 percent higher than the U.S. rate of 1.5[4-6]. The effectiveness of safety belts in preventing death and injury due to MVC's under various conditions has been established by NHTSA[7]. Using their findings, and data from Kentucky's Crash Outcome Data Evaluation System (CODES) [8], it was estimated that safety belts are 50 percent effective in preventing fatalities in Kentucky, and 55 percent effective in preventing moderate-to-critical injuries. Therefore, if Kentucky's usage rate had been equal to the national average in 2004, 57 of the fatalities (813 * 0.14 * 0.50) and 307 of the hospitalizations (3,984 * 0.14 * 0.55) mentioned above could potentially have been prevented.

In addition to the loss of life and the injuries they cause, MVC's have a wide-ranging economic impact, creating direct and indirect costs to public insurance programs, commercial insurers, local organizations such as police, fire and emergency medical services, private businesses, and ultimately the general public through higher insurance premiums and medical costs. NHTSA has developed a software program, called MVS, which estimates costs for medical care, emergency services, rehabilitation, lost productivity, legal services, workplace losses, and insurance administration[9]. Using this software it was estimated that the total economic costs for crashes in Kentucky in 2004 were $1.9 billion. This includes both fatal and nonfatal injuries as well as crashes involving property damage only. (This compares to the $2.2 billion in economic costs previously calculated using methods provided by the National Safety Council[4].) Of the $1.9 billion in total economic costs, $462 million (26 percent) were related to medical services. Commercial insurers pay the majority of these medical costs. However, a substantial burden also falls on private sources such as the Medicaid, Medicare, and Worker's Compensation systems[10].

1.2 Direct Medical Costs for MVC's in Kentucky

This report focuses only on the direct medical costs (DMC) for Kentucky residents hospitalized as a result of MVC's. Furthermore, the primary concern was the impact on the state's Medicaid program. Patients treated and released from emergency departments were not considered, as those data are not currently captured in a centralized database. This means that the DMC related to 38,000 vehicle occupants who are treated and released from Kentucky ED's every year were not included in this analysis.

DMC can be divided into those costs that occur in the first year after the injury ("first-year costs"), and costs that accrue in subsequent years ("additional-year costs"). First-year costs can be further divided into the charges for the initial hospitalization, which are readily available from the state's HIDD, and costs related to post-discharge medical care that occurs during the first year.

For many persons injured in MVC's there will be relatively little DMC beyond the initial hospital stay. However, certain types of injuries commonly result in post-discharge costs in the first year, and possibly in additional years. The sources of these costs may include rehabilitation, nursing home services, medication and pain management, and others. This study focuses on two such types of injury, TBI and SCI, for which there are data available about these post-discharge costs. For injuries other than TBI and SCI, only the initial hospital charges were considered.

Special emphasis was placed on DMC to the state's Medicaid system, but estimates of the costs to commercial insurers, Medicare and Worker's Compensation were also calculated. For these payers the only DMC considered were the initial hospital charges because, unlike Medicaid, information was not available about the percentage of injured persons whose post-discharge costs would be paid by each of these sources. Therefore, the DMC for MVC-related hospitalizations for commercial insurers, Medicare, and Worker's Compensation are understated in this report.

The DMC for MVC's, and the savings that would result from a primary enforcement law, were estimated over a ten-year period from 2006 to 2015. A ten-year time period was chosen as the number of years to study to illustrate that the medical costs resulting from MVC's continue to accumulate over time, but clearly they will not do so indefinitely. The average life expectancy for survivors of a TBI or SCI is more than ten years[9], so it can be reasonably assumed that some injuries that occur in 2006 will continue to result in medical costs in 2015.

2.0 DATA SOURCES AND METHODS

2.1 Data Sources

The primary data source for this analysis was the Kentucky Hospital Discharge Database (HIDD) for 2004, which is administered by the Kentucky Hospital Association. Variables included in this database were the external cause of injury code, or E-code

(which was used to classify motor vehicle crash-related discharges), diagnosis codes (which were used to classify TBI and SCI), total hospital charges, expected sources of payment, etc. Other data sources included Kentucky HIDD's for 2002 and 2003 and the Kentucky CODES database for 2003. The CODES database consists of linked data from police crash reports and hospital records and provides information about the crash characteristics for occupants who were hospitalized.

2.2 Kentucky-Resident Motor Vehicle Occupants Hospitalized by MVC's

In this report only Kentucky-resident motor vehicle occupants who were hospitalized as a result of an MVC were considered. Data for hospitalizations were taken from Kentucky's HIDD for 2004. For all figures critical to the analysis, three-year averages for 2002 through 2004 were calculated to confirm that the numbers for 2004 are representative of recent years (see Appendix A). A MVC-related hospitalization involving a vehicle occupant was defined as one having an external cause of injury code in the range E810-E819, with a fourth digit of 0, 1, 8, or 9. Because some Kentucky residents injured in MVC's are hospitalized out-of-state, an attempt was made to determine the numbers hospitalized in states that border Kentucky. The numbers of residents hospitalized in Illinois, Indiana, Ohio, and Tennessee were determined through personal communications (Illinios and Indiana: M. Fazey, July 2005; Ohio: A. Chaney, August 5, 2005; Tennessee: J. Chadwell, August 8, 2005). Based on these inquiries, it appears that the number of Kentuckians hospitalized out-of-state for MVC's is approximately offset by the number of out-of-state residents hospitalized in Kentucky. Therefore, because access to the HIDD for bordering states could not be obtained, all motor vehicle occupants hospitalized in Kentucky were used to represent the true target population of all Kentucky residents involved in MVC's.

2.3 Definitions of TBI and SCI

TBI and SCI are central to the analysis because they represent significant sources of long-term medical costs that are not accounted for when considering only hospital inpatient records, and because there are credible data available about the long-term medical costs for these kinds of injuries. The Centers for Disease Control and Prevention (CDC) have developed case definitions for TBI and SCI based on the World Health Organization's International Classification of Disease (ICD) systems[11,12] (Tables 1 and 2). These definitions have been widely adopted in the United States for TBI and SCI surveillance. The case definitions used in this report are based on those published in CDC's *Central Nervous System Injury Surveillance Data Submission Standards – 2002*[13].

Table 1. Case Definition for TBI

ICD-9 code(s)	Description
800.0-801.9	Fracture of the vault or base of the skull
803.0-804.9	Other and unqualified and multiple fractures of the skull
850.0-854.1	Intracranial injury, including concussion, contusion, laceration, and hemorrhage
950.1-950.3	Injury to the optic chiasm, optic pathways, and visual cortex
959.01	Head injury, unspecified

Table 2. Case Definition for SCI

ICD-9 code(s)	Description
806.0-806.9	Fracture of the vertebral column with spinal cord injury
952.0-952.9	Spinal cord injury without evidence of spinal bone injury

Table 3 outlines the case definitions, in terms of ICD-9 codes, for the four levels of injury severity used in this report to determine the medical costs of SCI. These definitions were obtained from V. Farris of the National Spinal Cord Injury Statistical Center (personal communication, August 17, 2005).

Table 3. Case Definitions for Levels of SCI Severity

Injury severity	Definition	ICD-9 codes
High quadriplegia	Injury to C1-C4	806.00-806.04, 806.10-806.14, 952.00-952.04
Low quadriplegia	Injury to C5-C7	806.05-806.09, 806.15-806.19, 952.05-952.09
Paraplegia	Injury to T1-S5	806 (.2-.7), 952 (.1-.4)
Incomplete motor function at any level	-	806.8, 806.9, 952.8, 952.9

2.4 Direct Medical Costs Model

The model for the DMC of MVC's to Medicaid is based on Chaudhary and Preusser[14] and consists of three categories of injury and two time frames (Table 4). For many persons injured in MVC's there will be little or no DMC beyond the initial hospital stay. However, certain types of injury commonly result in post-discharge costs in the first year and possibly in subsequent years. This study focused on two such types of injury, TBI and SCI, for which there are data available about these post-discharge costs. A combination of sources was used to obtain these costs for TBI and SCI. For discharges that did not involve a TBI or SCI diagnosis, only the initial hospital costs were considered.

Table 4. Data Sources for Medical Costs of Injuries to Medicaid

	First year		
Type of injury	Initial hospital costs	Post-discharge costs	Additional year costs
TBI	Kentucky HIDD	Craig Hospital	Craig Hospital
SCI	NSCISC	NSCISC	NSCISC
Other	Kentucky HIDD	N/A	N/A

TBI: The initial hospital costs to Medicaid for MVC-related TBI were calculated from Kentucky's hospital inpatient discharge database for 2004. It must be noted that hospital discharge datasets capture the charges *billed*, which are generally somewhat higher than the adjudicated costs to the payer.

Craig Hospital has published estimates of post-discharge, first-year costs and additional-year costs for TBI, which were used in this report. For TBI, the average post-discharge, first-year costs are $40,000, and the average additional-year costs are $26,871[14].

SCI: Similarly, NSCISC reports that average SCI costs per patient range from $201,273 to $682,957 in the first year and from $14,106 to $122,334 in each additional year, depending on the severity of the injury[15]. Note that the estimates of first-year SCI costs in Table 5 include the initial hospital costs, so the hospital charges from the Kentucky HIDD were not used.

Table 5. Average Yearly Expenses for SCI, by Severity (in May 2004 dollars)

Injury severity	First year	Each subsequent year
High Quadriplegia	$682,957	$122,334
Low Quadriplegia	$441,025	$50,110
Paraplegia	$249,549	$25,394
Incomplete motor function at any level	$201,273	$14,106

Other injuries: For Kentuckians hospitalized for an MVC with no diagnosis of TBI or SCI, the DMC was defined to be equal to the initial hospital charges from Kentucky's HIDD.

2.5 Source of Payment for First-Year DMC

The Kentucky HIDD includes a primary or expected source of payment, such as Medicaid or commercial insurance, as well as secondary and tertiary payment sources. The primary payer was used in this report to determine who would pay the first-year medical costs.

2.6 Source of Payment for Additional-Year DMC for TBI and SCI Patients

Finally, in order to calculate the additional-year costs to Medicaid for persons who experienced a TBI or SCI in a given year, it was also necessary to estimate the number of injured persons whose long-term medical expenses would be paid by Medicaid. According to the Craig Institute, the percentage of TBI patients on Medicaid will double in the year following injury, and 25 percent of all persons who experience an SCI will become Medicaid patients[14].

2.7 Effectiveness of Safety Belts in Preventing Injury

According to NHTSA, the estimated effectiveness of safety belts in preventing moderate-to-critical injury varies depending on the type of vehicle in which the occupant is riding (passenger car versus light truck), the type of safety belt used (lap belt only versus lap and shoulder belt), and the occupant's position in the vehicle (front seat versus rear seat)[7]. Linked collision report and hospital discharge data were used from Kentucky's CODES system for 2003, which was the most recent year available, to determine the number of occupants with each combination of vehicle type, belt type, and position in the vehicle (see Table 6). These numbers were used to calculate a weighted average effectiveness for Kentucky of 55 percent, as follows:

$$\text{Effectiveness} = (11 * .30 + 14 * .37 + \ldots + 62 * .78) / (45 + 2{,}838) = 0.55$$

Table 6. Effectiveness of Safety Belts in Preventing Moderate-to-Critical Injury for Kentucky, 2003

	Lap belts		Lap/shoulder belts	
Vehicle type and seating position	Effectiveness	Number of occupants hospitalized in KY	Effectiveness	Number of occupants hospitalized in KY
Passenger cars, front seat	30%	11	50%	1,824
Passenger cars, rear seat	37%	14	49%	80
Light trucks, front seat	55%	10	65%	872
Light trucks, rear seat	68%	10	78%	62
Total	-	45	-	2,838

For fatal injuries, the effectiveness was calculated as follows (see Table 7 for details):

$$\text{Effectiveness} = (2 * .35 + 0 * .32 + \ldots + 4 * .73) / (4 + 271) = 0.50$$

Table 7. Effectiveness of Safety Belts in Preventing Fatal Injury for Kentucky, 2004

Vehicle type and seating position	Lap belts		Lap/shoulder belts	
	Effectiveness	Number of occupants hospitalized in KY	Effectiveness	Number of occupants hospitalized in KY
Passenger cars, front seat	35%	2	45%	178
Passenger cars, rear seat	32%	0	44%	9
Light trucks, front seat	50%	2	60%	80
Light trucks, rear seat	63%	0	73%	4
Total	-	4	-	271

2.8 Safety Belt Usage Increase Resulting from Primary Enforcement

According to NHTSA, the typical safety belt usage increase for states that have enacted primary enforcement legislation is between 10 and 15 percentage points[10]. In this report it was assumed that Kentucky would experience an increase of 13 percentage points. This would move the state's observed usage rate from the 2005 level of 67 percent to 80 percent, which was the national average in 2004. To reflect the uncertainty about Kentucky's expected increase, the estimated savings to Medicaid over a range of 11 to 15 percentage points were also calculated.

2.9 Calculations of DMC and Savings to Medicaid

With these definitions and assumptions, the following methods can be used to calculate the short- and long-term direct medical costs and savings for Kentuckians involved in MVC's from 2006-2015.

The short-term or first-year costs to Medicaid for TBI patients were estimated as the following:

$$CTBI_s = H_{TBI} + a * N_{TBI} \qquad (1)$$

in which

$CTBI_s$ = TBI costs to Medicaid in first year

H_{TBI} = the initial hospital costs to Medicaid for TBI patients

N_{TBI} = the number of TBI on Medicaid who survived hospitalization

a = the first-year post discharge medical costs (estimated at $40,000 per TBI patient).[14]

The short-term or first-year costs to Medicaid for SCI patients were estimated as the following:

$$CSCI_s = \sum (b_i * N_{(SCI)i}) + \sum (c_i * 0.254 * n_{(SCI)i}) \qquad (2)$$

in which

$CSCI_s$ = the total cost

$N_{(SCI)i}$ = the number of SCI patients from the HIDD having primary payer of Medicaid at each severity level (high quadriplegia, low quadriplegia, paraplegia, incomplete motor function)

b_i = the average first-year expenses for SCI patients at each severity level (Table 5)

c_i = the average first-year post-discharge costs for patients at each SCI severity level, calculated as the difference between the average first-year expenses (i.e., b_i) and the average initial hospital costs for SCI patients from the HIDD

$n_{(SCI)i}$ = the number of MVC-related SCI patients at each severity level who survived the initial hospitalization, excluding those who had a primary payer of Medicaid. It was assumed that 25.4 percent of all SCI would become Medicaid recipients.[14]

The additional-year costs to Medicaid for TBI patients were estimated as the following:

$$CTBI_L = d * 2N_{TBI} \qquad (3)$$

in which

$CTBI_L$ = the cost to Medicaid in each year subsequent to the injury

d = the average medical cost per TBI patient in each additional year and is estimated at $26,871. It was assumed that the proportion of TBI patients on Medicaid would double starting in the year following the injury.[17]

The additional-year costs to Medicaid for SCI patients were estimated as the following:

$$CSCI_L = \sum (e_i * 0.254 * T_{(SCI)i}) \qquad (4)$$

in which

$CSCL_L$ = the cost to Medicaid in each year subsequent to the injury

e_i = the average expenses in each subsequent year for each SCI severity level (Table 5)

$T_{(SCI)i}$ = the number of SCI patients in each severity level who survived the initial hospitalization.

The first year Medicaid savings were estimated as the following:

$$S_s = R_1 * R_2 * TC_s \quad (5)$$

in which

R_1 = the percentage-point increase in belt use divided by 100

R_2 = the effectiveness of the safety belts in preventing moderate-to-critical injury

TC_s = the total costs to Medicaid in the first year.

The additional-year Medicaid savings were estimated as the following:

$$S_L = R_1 * R_2 * TC_L$$

in which

TC_L = total additional-year costs to Medicaid. (6)

3.0 RESULTS

In 2004, there were 3,984 motor vehicle occupants hospitalized in Kentucky as a result of crashes. Of these, 1,271 were diagnosed with a TBI, 89 with an SCI, and 2,624 had no diagnosis of TBI or SCI. There were 29 occupants diagnosed with both TBI and SCI.

3.1 DMC and Savings to Kentucky's Medicaid Program

3.1.1 First-Year DMC

TBI: Of the 1,271 vehicle occupants diagnosed with TBI as a result of an MVC in 2004, Medicaid was the expected source of payment for 99 (7.8 percent). The hospital charges for these 99 persons totaled $4,422,650. Ten of these persons died in the hospital, leaving 89 who would potentially have post-discharge costs, which were also assumed to have been paid by Medicaid. Craig Hospital estimates that these post-discharge costs will average $40,000 per person in the first year after injury[14]. Combining the in-hospital charges with the post-discharge costs gives total first-year costs for TBI patients of $7,982,650 as shown in Table 8.

SCI: Of the 89 vehicle occupants diagnosed with SCI as a result of an MVC in 2004, Medicaid was the expected source of payment for eight (9 percent). According to NSCISC, costs for treatment of SCI vary considerably with the severity of the injury

(Table 5). Two of the eight Medicaid SCI patients were diagnosed as high quadriplegic, two as low quadriplegic, three as paraplegic, and one as having 'incomplete motor function'. Applying the costs shown in Table 5 to these eight cases resulted in total first-year costs of $8,068,576 for SCI as reported in Table 8.

Other injuries: Of the 2,624 persons who had no TBI or SCI diagnosis, Medicaid was the expected source of payment for 228, and their hospital charges totaled $5,633,190. These are the first-year charges indicated for "Other injuries" in Table 8. They do not include post-discharge costs because no information about the magnitude of such costs was available.

3.1.2 Additional Years DMC

TBI: The number of Kentucky residents with TBI on Medicaid in subsequent years can be expected to double from the number who survived the initial hospitalization[17]. For example, in 2004 there were 89 vehicle occupants who were discharged alive from Kentucky hospitals with a TBI. Therefore it was assumed that in 2005 and later years there will be 178 TBI patients on Medicaid from among those who were injured in 2004. Craig Hospital estimates average additional-year costs for TBI of $26,871 per person[14], yielding an annual additional-year DMC for TBI of $4,783,038 as indicated in Table 8.

SCI: It was estimated that approximately 25 percent of the 85 vehicle occupants diagnosed with an SCI in 2004 who survived the initial hospitalization will have expenses paid by Medicaid in subsequent years[14]. Costs for SCI treatment vary by injury severity; NSCISC estimates the average additional-year costs noted in Table 5. Of the 85 survivors of MVC-related SCI in 2004, 14 were diagnosed as high quadriplegic, 19 low quadriplegic, 45 paraplegic, and 7 as having 'incomplete motor function.' These numbers were prorated to 25 percent and multiplied by the corresponding average cost from Table 5, producing the annual additional-year DMC of $999,185 noted in Table 8.

Other injuries: No attempt was made to calculate additional-year DMC for persons who were not diagnosed with TBI or SCI, since no reliable data about such costs were available.

3.1.3 Total Annual DMC to Medicaid

Table 8 shows that the total first-year DMC to Medicaid for MVC-related hospitalizations that occurred in 2004 were $21.7 million. Also, those injuries result in $5.8 million in DMC to Medicaid in each subsequent year.

Table 8. Medicaid Costs and Savings for the First Year and Each Subsequent Year

	First year	Each additional year
TBI	$7,982,650	$4,783,038
SCI	$8,068,576	$992,185
Other	$5,633,190	N/A
Total	$21,684,416	$5,775,223
Saved by primary law	$1,550,436	$412,928

3.1.4 Estimated DMC Savings to Medicaid from 2006 to 2015

Once the DMC to Medicaid was determined, it was relatively straightforward to estimate the savings that would result from primary enforcement. According to NHTSA, safety belt use in states has typically increased by 10 to 15 percentage points in the year following enactment of primary enforcement legislation[10]. For this analysis, a 13 percentage point increase was assumed for Kentucky. Such an increase would move the usage rate in Kentucky from the 2005 level of 67 percent to 80 percent, which was the national average in 2004. Also, based on a model developed by NHTSA, the effectiveness of safety belts in preventing injury can be calculated as a weighted average of various vehicle types, restraint types, and seating positions (see Data Sources and Methods for details). Using this model, together with data from Kentucky's CODES project, the effectiveness of safety belts in preventing injury in Kentucky was estimated to be to be 55 percent (see Data Sources and Methods for details).

Next, the savings that would be realized if a primary enforcement law were enacted in 2006 were estimated. Table 8 shows that the first-year savings to Medicaid due to the additional vehicle occupants that would wear a safety belt and be uninjured are $1.55 million ($21,684,416 * .13 * .55). Also, in each additional year there would be Medicaid savings of $0.41 million ($5,775,223 * .13 * .55) in long-term costs for treatment of TBI and SCI related to those same prevented injuries. Projected over ten years, the total DMC savings to Medicaid for hospitalizations that occur *in 2006 alone* would be $1.55 million + 9 * $0.41 million = $5.2 million.

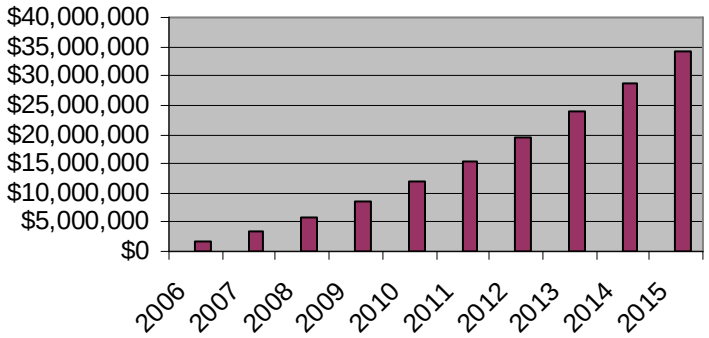
The same reasoning can be applied to each year from 2006 through 2015 to arrive at a total estimated savings for the ten-year period. The savings for each year, assuming passage of a primary safety belt law in 2006, are presented in Table 9. For 2006, there would be $1.55 million in DMC savings. In 2007, the savings would be $1.96 million: $1.55 million in first-year savings plus one additional-year savings of $0.41 million from hospitalizations that occurred in 2006. Continuing with this logic over the remaining years, the accumulated savings would be $3.2 million for 2010 and $5.3 million for 2015.

Table 9. Savings to Kentucky's Medicaid Program, by Year, Resulting from Implementation of a Primary Enforcement Law in 2006 (in Thousands)

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Savings	$1,550	$1,963	$2,376	$2,789	$3,202	$3,615	$4,028	$4,440	$4,854	$5,267

The cumulative savings over the ten-year period are illustrated in Figure 1. There would be $12 million saved by 2010, and $34 million by 2015.

Figure 1. Cumulative DMC Savings to Kentucky's Medicaid Program Resulting from Implementation of a Primary Enforcement Law in 2006



3.1.5 Estimated DMC Savings to Medicaid for a Range of Increases in Safety Belt Use

In the preceding analysis a 13 percentage point increase in the state's safety belt usage rate was assumed. In Table 10, the cumulative DMC savings to Medicaid from 2006 to 2015 are projected over a range of possible rises in usage. With a boost of 10 percentage points, the state could expect to save $26 million over 10 years; at an increase of 15 percentage points, the savings would be $39 million.

Table 10. Cumulative Savings to Medicaid from 2006 to 2015 (in millions)

	Safety belt usage increase, in percentage points					
	10	11	12	13	14	15
Cumulative savings ($)	$26.2	$28.8	$31.4	$34.1	$36.7	$39.3

3.2 DMC and Savings to Other Payers

Medicaid is not the only payer that will benefit by cost savings from a primary enforcement law. Using a simplified version of the methods used for Medicaid, the DMC savings were calculated for the other major sources of payment. The results are displayed in Table 11. These figures account only for charges related to the initial hospitalization. The reason is that there was no information available to determine the

number of injured occupants for which these payer(s) would bear the post-discharge and long-term costs, whereas this information was available for Medicaid. Therefore these can be considered minimum savings.

Table 11. Cumulative DMC Savings for 2006-2015 for Other Major Payers

Payer	Savings (in millions)
Commercial insurance	$67.0
Medicare	$2.3
Worker's Compensation	$3.3
Other sources	$11.2

4.0 SUMMARY

MVC's create a considerable burden on Kentucky's Medicaid program. Primary enforcement of the state's mandatory safety belt law will increase usage, resulting in fewer injuries and reduced costs to Medicaid and other payers. In particular, implementation of primary enforcement in 2006 could lead to a total savings of at least $118 million in direct medical charges over the ten-year period from 2006 to 2015. This would include savings of $34 million to Medicaid, $67 million for commercial insurers, $2.3 million to Medicare, $3.3 million to Worker's Compensation, and $11.2 million to other sources.

Many persons injured in MVC's have only short-term costs for treatment of injuries. However, some persons, for example those with TBI or SCI, will need treatment and services for many years, and their medical costs over time can become substantial. This report attempts to take into account these longer-term costs.

Medical costs are only a portion of the total economic burden created by MVC's. NHTSA has estimated that the costs of medical care, emergency services, rehabilitation, lost productivity, legal services, workplace losses, and insurance administration when taken together amounted to $1.9 billion for Kentucky in 2004 (including both fatal and nonfatal injuries, as well as crashes with property damage only)[9]. Commercial insurers absorb a large portion of these costs. However, private sources such as Medicaid, Medicare, and Worker's Compensation also pay substantial amounts.

5.0 RECOMMENDATIONS

This report documents the savings in medical costs which can be achieved through a safety belt law which includes primary enforcement. These savings are a result of a reduction in fatalities and serious injuries among motor vehicle occupants. The data support modification of Kentucky's current law to allow primary enforcement.

To arrive at these results, it was necessary to rely in part on short- and long-term medical cost estimates for TBI and SCI from sources outside of Kentucky. The state's traffic records plan should include a goal to generate Kentucky-specific data on medical costs for MVC's, particularly long-term costs. This will allow more complete assessment and evaluation of all highway safety policy issues, not only primary enforcement. A complete traffic records system should include data on costs of crashes and who pays those costs. In addition to secondary data sources such as the state's hospital discharge database, surveys and other primary methods may be necessary to track these data.

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APPENDIX A.

Table A-1. Values for Key Cost Parameters for 2004 and Average over 2002-2004

Parameter	2004	2002-2004
Hospitalizations for motor vehicle occupants (MVO)	3,984	4,051
MVO hospitalized with TBI	1,271	1,297
MVO hospitalized with SCI	89	76
MVO hospitalized with no SCI or TBI	2,624	2,678
MVO with TBI and expected payer Medicaid	99	97
MVO with SCI and expected payer Medicaid	8	7
MVO with no TBI or SCI and primary payer Medicaid	228	209